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IMPERIAL BUREAU OF ANIMAL HEALTH

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Vol. 9.] April, 1939. [No. 4.

DISEASES CAUSED BY BACTERIA AND FUNGI

PETERSON, E. H., HASTINGS, E. G., & HADLEY, F. B. (1938). **The Pathology of Non-Specific Mastitis and Consideration of Possible Aetiological Agents.** —*Cornell Vet.* **28.** 307-324. 8 figs., 2 tables. [Numerous refs.]

The authors quote literature references in support of the view that mastitis can exist " in the absence of streptococci or any other recognized pathogen in the milk ". The present paper is concerned with the pathology of this co-called " non-specific mastitis " and possible aetiological agents. The changes, illustrated by photographs, consist of a fibrous thickening of the inter- and intralobular connective tissue, which leads to shrinking of the alveoli and degeneration of the lining epithelium. There is also an infiltration with lymphocytes, but neutrophiles are few.

The authors recognize that, among the bacteria, staphylococci are the only possible causal agents. Such organisms, however, were found " only occasionally and in low counts " and, for this and other reasons, it is argued that they are not the cause. [The matter cannot be discussed at any length, but it would surely be rash to conclude that a light infection with staphylococci—organisms which are known to produce a soluble toxin—might not be responsible for the alterations in the gland. Moreover the changes do not appear to differ essentially from those which have been observed in chronic staphylococcic mastitis. The authors think that, if " non-specific mastitis " were due to staphylococci, acute clinical symptoms might sometimes be expected to develop, and this they have never seen. Actually the converse would be expected, since mild staphylococcic infections would tend to induce an antitoxic immunity.] The hypothesis is put forward that " non-specific mastitis " is due to a filtrable virus, but no definite confirmatory evidence could be obtained.—F. C. MINETT.

WILLIAMS, W. L. (1937). **The Detection of Shedders of the Streptococcus of Mastitis in Composite Control Milk Samples.**—*J. Dairy Sci.* **20.** 711-717. 2 tables. [11 refs.]

Routine clinical examination of dairy cows, together with chemical tests, does

not detect all cows with mastitis streptococci. The laboratory identification of udder streptococci involves rather onerous work. Microscopic demonstration of streptococci does not always indicate mastitis, since saprophytic streptococci may be found in milk, and have been cultured from samples of milk taken aseptically. High cell counts from bulk samples are less significant than those found in individual samples.

A series of cultural tests are described which were used as a rapid routine procedure for the identification of mastitis streptococci. All bulk samples showing long-chained streptococci or having high cell contents were cultured, and if growth was obtained, individual samples were then taken.

Water used for rinsing pipettes contained 50 p.p.m. of chlorine as an antiseptic. Milk in 2 c.c. samples was inoculated into 10 c.c. of fresh sterile 1% sodium carbonate and incubated overnight at 37°C. Individual samples of milk taken aseptically were incubated in the containers. Blood agar plates were streaked and incubated at 37°C. for 24 hours. Streptococci causing any degree of haemolysis were transferred to litmus milk and incubated overnight. Pure cultures were then transferred to 1% sodium hippurate or 1% aesculin in Douglas broth, and incubated at 37°C. for 72 hours. Approximately 4 c.c. of each medium were used. About 0·2 c.c. of 1% aqueous solution of ferrous citrate is used as indicator of splitting of aesculin. Medium containing trehalose and sorbitol were used to differentiate human from animal strains.—H. E. Bywater.

Clark, R. (1938). **Speculations on the Incidence of Anthrax in Bovines.**—*J. S. Afr. vet. med. Ass.* **9.** 5-12. 5 tables.

C. made some observations on the incidence of anthrax in bovines in the Eastern Orange Free States over a period of a few years. He puts forward the theory that most outbreaks are not due to ingestion of infected grass or water, but to chewing bones or hides of anthrax carcasses. Anthrax was more common in the summer months, but outbreaks were unrelated to rainfall incidence. The value of anthrax vaccination, in stopping mass outbreaks of the disease, was clearly demonstrated. Vaccination could not be held wholly responsible for the cessation of outbreaks on farms where carcass material was disposed of in the proper manner.

—E. M. Robinson.

Radojčević, M. (1937). Prilog poznavanju utjecaja passaža na patogenost B. anthracis-a. [**Effect of Animal Passage on** *Bacillus anthracis*].—*Jugoslov. vet. Glasn.* **17.** 443-455. 8 figs., 3 tables. [Numerous refs.] [German summary].

Three experiments were carried out in order to attenuate a fully virulent strain of *B.a.* The strain was passaged 150 times through the brains of rabbits, and 100 times through the brains of white rats, and a series of 70 sub-cultures were made on a medium containing brain substance.

After 30 of these sub-cultures there was already considerable alteration of pathogenicity for rabbits, the organisms also becoming smaller and losing their ability to form capsules, but pathogenicity was not completely lost at this point, or even after all 70 sub-cultures.

The 150 passages through rabbit brains had no influence on the pathogenicity or the morphological characters of the organisms. On the other hand, 40 passages through rat brains caused the loss of capsules, and after the 100th passage a diminution of the size of colonies was noted, as well as a lowered pathogenicity for sheep; the organism was, however, still fully pathogenic for both rabbits and rats.

—B. Oswald (Križevci).

WOHLFEIL, T., & WOLLENBERG, H. (1938). Ueber Fermenthemmung und -Förderung bakterieller Fermente im infizierten Tierkörper. II. Wirkung von Cu··, Hg··, Monojodessigsäure, Fe··, Ferroaskorbinsäure, Phosphaten und Natriumzitrat auf den Ablauf der Milzbrandinfektion des Meerschweinchens und der Proteusintoxikation und -Infektion des Kaninchens. **[The Inhibition and Stimulation of Bacterial Ferments in the Animal Body. II. Effect of Metallic Ions and Chemical Compounds on Anthrax in Guinea Pigs and of Proteus Intoxication and Infection on Rabbits]**.—*Zlb. Bakt. I.* (*Orig.*). **141.** 159-170. 7 tables. [Numerous refs.]

The administration of monoiodoacetic acid either before or after the artificial inoculation of g. pigs with virulent anthrax bacilli resulted in a slower onset of septicaemia and a longer survival period as compared with g. pigs which received no monoiodoacetic acid. Treatment with copper sulphate, corrosive sublimate and novasural in non-toxic doses, produced a rather similar result. On the other hand the lethal effect of *Proteus vulgaris* is exaggerated by the administration of ferro-ammonium sulphate. From experiments of this type it is suggested that, in general, proteinase-inactivating substances tend to decrease pathogenicity, which is increased by substances which stimulate such enzymes.—E. J. PULLINGER.

RUSSEFF, C. (1937). Prüfung der Resistenz banginfizierter Meerschweinchen gegenüber einer Milzbrandsuperinfektion. **[The Resistance of Brucella-Infected Guinea Pigs to Superinfection with Anthrax]**.—*Z. ImmunForsch.* **90.** 78-80. [9 refs.]

Working with small groups of g. pigs, R. found that whilst normal g. pigs and those injected with *Br. abortus* died equally rapidly after artificial infection with anthrax, tuberculous g. pigs infected with anthrax survived for a significantly longer interval.—E. J. PULLINGER.

GORDON, Ruth E. (1937). **The Classification of Acid-Fast Bacteria.**—*J. Bact.* **34.** 617-630. 5 figs., 2 tables. [7 refs.]

G. was able to separate 80% of 252 strains of saprophytic acid-fast bacilli, isolated from soil, plants and animal tissues, into three main groups, based on the following criteria :–

GROUP I : *Mycobacterium smegmatis* type, fails to survive 60°C. for one hour, and grows at 47°C.:– (a) utilizes arabinose : 105 strains similar in appearance and cultural reactions, and (b) unable to utilize arabinose : four strains different in appearance and cultural reactions from above cultures and from each other.

GROUP II : fails to survive 60°C. for one hour, and does not grow at 47°C. :–
(a) unable to utilize sorbitol :–
(1) unable to utilize arabinose : 66 strains similar in appearance and cultural reactions, 22 strains different from the above and from each other ; and
(2) utilizes arabinose : seven dissimilar strains, and
(b) utilizes sorbitol : 18 dissimilar strains.

GROUP III : *Mycobacterium phlei* type, survives 60°C. for one hour and grows at 47°C. :– (a) utilizes arabinose : 29 strains similar in appearance and cultural reactions, and (b) unable to utilize arabinose : one strain differing in appearance and cultural reactions from the above cultures.

The original article should be consulted for further technical details.

—D. L. HUGHES.

ROBIN, V. (1938). Sur la procédure en matière de tuberculose bovine. **[Bovine TB. from the Legal Aspect]**.—*Rec. Méd. vét.* **114.** 343-352. [9 refs.]

A discussion on the difficulties arising from various aspects of the law relating to the control of bovine TB. and sale of affected cattle in France.

R. considers the position of buyers of animals affected with forms of TB. which are regarded in law as contagious, including advanced infection of the lungs, intestines, uterus or udder, or of animals with other forms of TB. not officially regarded as contagious. Court rulings and opinions of legal experts are quoted.

He differentiates between action for breach of warranty and for nullity of sale, and emphasizes the difficulty of diagnosis of certain forms such as tuberculous enteritis and metritis.—H. BURROW.

DOEVE, W. C. A. (1938). Het afmaken van tuberculine-reactoren. **[The Destruction of Tuberculin Reactors]**.—*Ned.-ind. Bl. Diergeneesk.* **50.** 45-59.

D. advises against the indiscriminate slaughter of tuberculin test reactors among cattle in the Dutch East Indies, as the test is not free from error [false positive reactors]. In his opinion clinical and bacteriological examinations should be made the basis of the removal of tuberculous animals.—JAC. JANSEN (UTRECHT).

GRAZZINI, A. (1936). Contributo allo studio delle forme anatomiche e sulla frequenza della tubercolosi nei bovini. **[Sites of Tuberculous Lesions in Cattle]**.—*Profilassi.* **9.** 91-92. [French and German summaries].

Cattle slaughtered in the La Spezia abattoir were examined P.M. for tuberculosis. They were divided into two classes :– (1) calves aged four months and under of which only two out of 25,581 were infected, and (2) older animals, of which just over 10% were tuberculous. Infection was more prevalent amongst stalled animals. In 87% of cases the seat of infection was pulmonary, in 2·3% it was intestinal, in 4% both respiratory and digestive organs were affected, and in 6·3% the disease was generalized.—S. F. J. HODGMAN.

DESSY, G. (1937). Expériences de vaccination antituberculeuse du bétail moyennant le vaccin de Belfanti-Dessy (atism). **[The Belfanti-Dessy Antituberculosis Vaccine for Cattle]**.—*Boll. Sez. ital. Soc. int. Microbiol.* **9.** 249-253. [2 refs.] [In French]. [Also appeared in *Clin. vet., Milano.* **60.** 700-702].

The vaccine referred to above consists of a live culture emulsified in saponin. It is said that this product is not pathogenic to cattle when innoculated subcutaneously at the base of the tail, that the only result is the development of a local nodule and that immunity results which lasts for at least a year. Unless two or three injections of vaccine are given the tuberculin test remains negative.

During five years, 256 cattle were vaccinated ; 146 were killed after exposure to infection [no details given], and only two showed any signs of TB. other than the vaccination nodule. Two vaccinated cows had been injected with virulent tubercle bacilli [no details] intravenously eight months after vaccination, no lesions were observed on slaughter six months later. Two vaccinated cows given live culture subcutaneously reacted with local abscesses only. Control cows contracted generalized TB.—P. S. WATTS.

LEGRAND, R., GERNEZ, C., CRAMPON, P., & LEFORT, E. (1938). Recherches comparatives sur les procédés d'isolement du bacille tuberculeux dans le lait de vache. **[Comparison of the Methods for the Isolation of Tubercle Bacilli from Milk]**.—*C. R. Soc. Biol. Paris.* **128.** 204-206. [1 ref.]

Four out of 75 samples (5·3%) of milk delivered for human consumption

direct from the farm in northern France were shown by g. pig inoculation to contain living tubercle bacilli.

Preliminary treatment of centrifuged deposit with 4% caustic soda for two hours, or with 15% sulphuric acid for half an hour, prevented infection by contaminants in over two-thirds of the g. pigs, but it reduced by half the positive results of the test.

About two-thirds of the cultures made from milk given preliminary treatment with 15% sulphuric acid for half an hour were contaminated with sporulating organisms, the isolation of tubercle bacilli then being impossible. It is suggested that formation of dense masses of coagulated casein that followed addition of the acid was partly responsible for this result. Preliminary treatment with 4% caustic soda for four hours at 37°C. of milk artificially infected with human tubercle bacilli did not inhibit subsequent growth of the bacilli.

In order to eliminate all sporulating organisms, however, this treatment would have to be continued for more than four hours and this would interfere with the demonstration of tubercle bacilli in cultures.—H. Burrow.

Joyner, A. L., & Sabin, F. R. (1938). **Altered Cutaneous Conditions in the Skin of Tuberculous Guinea Pigs as Demonstrated with a Vital Dye.**—*J. exp. Med.* **68.** 325-334. 4 figs. on 1 plate, 2 tables. [13 refs.]

It has been shown that in tuberculous g. pigs a dye injected intradermally does not spread, whereas it does spread in uninfected g. pigs.

A number of g. pigs, in the allergic state of TB., some in a moribund condition due to the same disease, or with epizootic lymphadenitis [a streptococcal infection —see *V. B.* **7.** 542], were inoculated intradermally with 0·025 c.c. of pontamine sky blue in each of the four quadrants of the ventral side, or in two sites on the midline of the dorsal aspect. A number of controls were similarly injected.

The measurements of the areas of spread of the dye were taken at 1 hour, 4 hours, and 24 hours respectively.

In g. pigs whose skin was in an allergic condition, due to TB. or epizootic lymphadenitis, the rate of spread of the dye was much slower than normal. When the skin was hypoergic or anergic, however, as in advanced TB., a faster spread than normal occurred. It is suggested that this dye method may disclose altered tissue conditions in the allergic state.—D. D. Ogilvie.

Horstmann, H. (1938). Ein Beitrag zum Rotlauf bei Enten. [**Infection of Ducks with the Bacillus of Swine Erysipelas**].—*Z. InfektKr. Haustiere.* **53.** 106-112. [14 refs.]

A description of naturally occurring cases of *Erysipelothrix rhusiopathiae* infection in two ducks.—E. J. Pullinger.

Yankovitch, J. (1937). La morve et les mesures de police sanitaire en Yugoslavie et en France. [**Regulations against Glanders in France and Yugoslavia**].—*Thesis, Alfort.* pp. 100. [Numerous refs.]

The history of glanders from Roman times is traced. Morphology, cultural characters and staining-reactions of *Pfeifferella mallei* are detailed and the modes of infection—chiefly by nasal route, by inoculation of abrasions on mucous membranes or skin or by ingestion of massive doses of organisms—are dealt with. There is a discussion of the species of animals which are susceptible to infection.

The pathology of the disease, including the origin and constitution of the lesions produced, is dealt with, and also differential diagnosis, both *ante-* and

post-mortem. Y. stresses the futility of vaccination and medicinal treatment, outlining measures for control by the free use of the mallein test, isolation and destruction of affected animals. He gives a detailed summary and critical comparison of the regulations in force for the control of glanders in France and Yugoslavia respectively.—H. BURROW.

RUSSEFF, C., & HENNINGER, E. (1937). Ueber die Züchtung von Rotzbazillen in synthetischen Nahrböden. **[The Cultivation of *Pfeifferella mallei* in a Synthetic Medium]**.—*Z. ImmunForsch.* **90.** 81-84. 2 figs. [7 refs.]

Pf.m. was successfully grown for mallein production on a synthetic medium containing a balanced mixture of salts plus 10% of glycerin and 0·1% of asparagine. In this medium the organism grew ten times more copiously than in glycerin meat broth, and the resulting culture proved excellent for the manufacture of mallein. —E. J. PULLINGER.

KUKLA, F. W. (1937). Ueber das Vorkommen von Fleischvergiftern bei Hunden. **[Meat-Poisoning Organisms in Dogs]**.—*Inaug. Diss., Hanover.* pp. 32. 7 tables. [Numerous refs.]

K. reports the examination for meat-poisoning organisms of faeces and organs of a large number of dogs with various chronic diseases. In 216 samples of faeces from 108 different dogs he found *Bacterium coli* 108 times, *Proteus vulgaris* 66 times, *Salmonella enteritidis* Gärtner once, *S. typhi-murium* once, and salmonella of an intermediate group seven times. In the organs of 25 dogs the findings were *Bact. coli* 25 times, *P. v.* 14 times, *S.e.* Gärtner three times and *S.t.-m.* once. He describes one case as a carrier, since *S.e.* Gärtner was demonstrable in its faeces over a period of about five months. The general conclusions are that dogs only become infected with meat-poisoning organisms in rare instances.—M. F. B.

HLAVÁČEK, B. (1937). Nakažlivé zmetání po infekci bac. parat. abortus equi. **[Infectious Equine Abortion]**.—*Voj. zdravotn. Listy.* **13.** 320-328. 1 table. [English, French and German summaries].

A description of *Salmonella abortus-equi* infection in mares and foals in a breeding stud. Conventional prophylaxis and treatment were carried out. —E. PŘIBYL (BRNO).

PIRIE, J. H. H. (1938). **Bacterial Encephalitis from the Genus Listerella : A New Disease of Man and Animals.**—*S. Afr. med. J.* **12.** 51.

In 1927, P. described an organism from an epizootic in gerbilles in the Orange Free State as *L. hepatolytica.* Subsequently he found the organism to be identical with *L. monocytogenes* described by MURRAY in England in 1926. Listerella infections have subsequently been described from encephalitic conditions in man and animals. Recently a listerella infection has been described in fowls with necrosis of the myocardium as the most prominent lesion.—E. M. ROBINSON.

KALIKIN, B. (1937). Eksperimentalni studij mehanižma infekcije i imuniteta kod kolere peradi. **[Infection and Immunity in Fowl Cholera]**.—*Jugoslov. vet. Glasn.* **17.** 428-442. 7 tables. [16 refs.] [German summary]. [See also *V. B.* **7.** 367].

K. concludes that oral infection with *Pasteurella aviseptica* can only occur when there is a lesion of the mucous membrane of the alimentary tract, that even with repeated doses of a highly virulent strain immunity cannot develop in the absence of such a lesion, that the cells which are susceptible to fowl cholera lie

beneath the intestinal mucous membrane, which must first be injured for either oral infection or immunization to take effect, that fowls may survive oral infection when such injured mucous membrane is in the stage of recovery, and that such fowls are thereafter immune. Strong immunity was obtained in fowls that were given salicylate vaccine *per os* following intestinal lesions caused by crushed glass particles mixed with the food. On account of the above observations K. strongly supports BESREDKA's theory (1928) concerning the existence of so-called receptive cells.

—B. OSWALD (KRIŽEVCI).

TRUCHE, M. (1938). La pseudo-tuberculose chez les animaux. [**Pseudo-tuberculosis in Animals**].—*Rev. Path. comp.* **38.** 874-883.

T. describes *Pasteurella pseudotuberculosis* infection of rodents and birds, occurring most commonly in the g. pig, and to a lesser extent in the rabbit, hare and cat. Of the larger animals, only sheep have been proved susceptible. A few cases have occurred in human beings. Of domestic birds, turkeys, ducklings and swans are chiefly affected. In g. pigs an acute septicaemic and a subacute type are recognized and the disease follows a similar course in rabbits and hares. In birds death usually occurs in 3-10 days following diarrhoea and emaciation. The lesions vary, but the lungs, lymph nodes or liver may be affected.

The causal organism is Gram-negative and non-sporulating. It gives a characteristic growth in broth, forming fine flakes which thicken and fall to the bottom of the tube. The cultural characters, biochemical and agglutination reactions, and results of experimental inoculation, are described, and methods of treatment discussed.—S. J. GILBERT.

MILLER, F. W., GRAVES, R. R., & FOHRMAN, M. H. (1937). **Management and Breeding Data on a Dairy Herd in which Bang's Disease (Infectious Abortion) was Eradicated by Segregation.**—*J. Dairy Sci.* **20.** 537-550. 8 tables.

This dairy herd was used for breeding and nutritional investigation by the Bureau of Dairy Industry, and had long been infected with contagious abortion. Isolation of 82 positive reactors to *Brucella abortus* was performed in 1926, leaving 65 negative reactors. 80 reactors were removed from the negative herd between 1926 and 1932, after which date no further reactors were found. Calves born in the positive group were fed on milk from that group until 60 days old, then on milk from negative cows for ten days, after which they were removed to the negative group and placed with negative calves after isolation for a further ten days. One calf remained a positive reactor until past breeding age. The same bulls were used for both herds, using neutral ground. The abortion-positive cows required more services per conception when bred after an abortion than when bred after a normal calving.—S. J. GILBERT.

I. ALEKSA, K. (1938). **Bovine Tuberculosis and Brucellosis in Lithuania. Bovine Tuberculosis.**—*Mon. Bull. agric. Sci.* **29.** 1T-4T. 2 tables.

II. PABIJANSKAS, A. (1938). **Bovine Tuberculosis and Brucellosis in Lithuania. Brucellosis and Its Control.**—*Ibid.* 4T-6T.

I. Only a small proportion of the herds in Lithuania comply with the control measures for TB., which are optional except in cases of mammary TB. Since 1930, when the present control scheme was begun, the number of herds examined has increased from 123 to 1,520, and the number of positive reactors has decreased from 11% to 8%. The number of cases of open TB. decreased from 2·3% in 1930 to 0·5% in 1936, and this drop made it possible to employ the slaughter policy for these cases. Positive reactors are slaughtered only with the owner's

consent. Under the present system the fees levied on animals slaughtered at abattoirs go to a special fund, and out of this indemnities are paid to owners for the cattle slaughtered. Indemnities are also paid for infected meat and milk confiscated at inspection, but only if the owner complies with the control regulations.

II. Brucella infection has increased in Lithuania with the stimulus given to stock-breeding; the number of infected herds has increased from 9 in 1932 to 227 in 1937. P. gives details of control measures. Every case must be declared; the herd is then tested, and infected cattle are segregated; they can only be sold for slaughter. If an owner consents to have all positive reactors slaughtered, he receives an indemnity of 50% of the value of the meat. Milk from infected herds can only be supplied to dairies where milk is heated to 85°C. for one minute, or to 65°C. for half an hour. Imported cattle have to have a certificate from the country of origin stating that they were examined shortly before sale and that the blood test was negative; in addition they are re-tested at the frontier, and quarantined until the result is known.

ITABASHI, K., ITO, S., WATANABE, S., TAJIMA, Y., & HARAKO, K. (1938). **Studies on Contagious Abortion in Cattle. I. Epizootiological Observations on Brucella Abortion among Cows at the Yamuyingtzu Stock Farm near Wangyehmiao, Inner Mongolia, Manchoukuo.**—*J. Jap. Soc. vet. Sci.* **17.** pp. 66-77 of pt. 1. 11 tables. [4 refs.] [In Japanese: abst. from English summary pp. 8-10 of pt. 2].

Blood agglutination tests carried out in May and June, 1936, yielded 19·8% and 42·1% of reactors to *Br. abortus*. After subsidence of the infection there was sterility in 24% of the herd. No difference was noted in the incidence of abortion among animals vaccinated with lanolin-live vaccine, lanolin-dead vaccine, or ordinary dead vaccine.

Abortions occurred with the same frequency among both positive and negative reactors, but sterility was more marked among the former.

It is stated that agglutinins were absent from the blood of infected cows so long as they remained sterile. It was concluded that infected bulls played no part in the spread of the disease.

It was noted that some infected cows repeatedly aborted.—H. BURROW.

GARDINAZZI, L. (1936). Contributi alla casistica dell'infezione spontanea da *Brucella Abortus* nel cavallo. [*Br.a.* **Infection in Horses**].—*Clin. vet., Milano.* **59.** 52-59. [20 refs.]

G. describes three cases which he treated. In a mare which developed "ulceration" in the left udder one month after her foal was weaned, microscopic examination of pus revealed a brucella-like organism [no cultures grown], and agglutination and c.-f. tests with the mare's blood were positive for *Br.a.* Two of three g. pigs inoculated with pus also reacted serologically and developed lesions of brucellosis. The sole possible source of infection was considered to be water which had passed over an infected area, and which the mare drank. The other two cases treated were of horses with swellings on the withers.

G. concludes that horses can contract infection and develop lesions in parts of the country where infection is not present amongst the cattle [no evidence produced].—S. F. J. HODGMAN.

TARASOV, I. (1937). Vospriimčivostj svineĭk brucellezu tipa *melitensis*. [**Susceptibility of Swine to** *Brucella melitensis*].—*Brucellosis in Sheep.* pp. 403-406. 1 table. Moscow: Viem Publ. Dept.

Agglutination tests failed to demonstrate brucella infection in any of the pigs

on a farm in North Caucasus on which sheep brucellosis was prevalent. *Br.m.* was recovered, however, from the carcass of a five-day-old piglet which had died in a herd in which there had been cases of abortion. Six pigs 4-6 months old were inoculated subcutaneously with large doses of *Br.m.* ; the organisms were found generalized throughout the internal organs of an animal inoculated with 5×10^9 bacteria, while in another given 10^6 bacteria infection was localized ; the remaining four animals did not become infected. These findings are considered to indicate that, although swine are naturally resistant to *Br.m.*, in exceptional cases they may become infected. S. considers that the matter requires further investigation.

LAFENÊTRE, H., & ROMAN, G. (1937). L'orchi-épididymite brucellique. [**Orchitis and Epididymitis Caused by Brucella Infection**].—*Rev. Méd. vét., Toulouse.* **89.** 700-706. [Numerous refs.]

The different types of brucella tend in males to become localized in the genital organs. One experimental and one clinical case are described in rams. A ram was infected by the application of *Br. melitensis* to a scarified area on the surface of the scrotum. When it was slaughtered 18 months later, an abscess of the prostate was observed, the size of a large orange, and *Br.m.* was recovered by culture and g. pig inoculation. In the second case which occurred in an infected flock, an induration of the left epididymis was observed in a three-year-old ram. On P.M. examination a series of small grape-like abscesses containing thick yellow pus were found, and yielded pure cultures of *Br.m.*

The authors draw attention to the possibility of infection being transmitted by rams infected in the genital organs.—S. J. GILBERT.

I. PALTRINIERI, S., & GHINELLI, I. (1937). Ricerche sulla transmissione sperimentale della brucellosi negli ovini per la via endorachidea. [**Artificial Infection of Sheep with Brucella *via* the Spinal Canal**].—*Nuova Vet.* **15.** 35-41. 1 fig., 2 graphs.

II. BETTINI, U. (1937). L'importanza delle vaccinazioni per la difesa contro l'aborto epizootico e per i casi di sterilita'ad esso legati.—[**Value of Dead Vaccine against Brucellosis and Sterility Associated with Brucellosis**].—*Ibid.* 257-260.

III. TIRAFERRI, E. (1937). Sul portere battericidia in vitro del sangue in toto sulla Brucella melitensis, sulla Br. paramelitensis e sulla Br. abortus. [**Bactericidal Power of Whole Blood for Brucella *in vitro***].—*G. Batt. Imm.* **19.** 9-16. 4 tables. [English, French, German and Spanish summaries].

I. The authors review at length experiments by various workers on the methods of infection of sheep with brucella, concluding that infection *via* the skin, after it has been shaved or scarified, or *via* mucous membrane, is more common than infection *via* the alimentary tract. They note that no experiments have so far been done on infection *via* the epidural space, and describe the results of two such inoculations on two animals in the sacral region. Paralysis in the quarters accompanied by a rise of temperature occurred. On a further injection subdurally into the atlanto-occipital space, both animals died with symptoms of acute meningitis.

II. B. reports a series of experiments carried out during the period 1930-1935 in the Province of Bologna and Ferrara. He claims to have established :– (1) the importance of brucellosis as a factor in sterility of cows ; (2) the value of dead vaccine, prepared according to the method of LANFRANCHI, in overcoming both abortion and sterility, and (3) that injection of the vaccine into the caudal fold

is more effective than into the neck, since in a single series of experiments abortion was reduced to 25% by the latter and to 1% by the former.

III. T. states that the best experimental conditions for demonstrating the bactericidal power of the blood of man and animals to the *Brucella* species are produced by contact of the blood with the organisms at 37°C. for 5-6 hours. The differences between the bactericidal power of the blood of man and that of animals' blood is small. In various samples a difference is found between the effects on *Br.m.* and the *Br.a.*, but the differences are small, follow no fixed rule, and vary. *Br. paramelitensis* is almost constantly less resistant than *Br.m.* or *Br.a.*

—S. F. J. HODGMAN.

KOTLJAROVA, N., & VERŠILOVA, P. (1937). Opyt sanacii brucelleznogo stada ovec putem serologičeskogo otbora životnyh. [**Attempt to Control Brucella Infection in Flocks of Infected Sheep, by Separating the Healthy from Infected Animals by Serological Tests**].—*Brucellosis in Sheep.* pp. 383-386. 1 table. Moscow: Viem Publ. Dept.

In June, 1933, an attempt was made to separate the brucella-infected sheep flocks on one of the sections of the Experimental Sheep Farm in North Caucasus into three distinct groups according to their response to the agglutination test; each animal was tested twice consecutively, the results being further checked by an additional test with melitin. The negatively reacting group (543 head) was similarly tested in October of the same year, and was kept on separate pastures, strictly isolated from the rest of the flocks. A second group (851 head) consisted of " doubtful " reactors. The remainder were grouped as infected and were not subjected to further examination.

During the following spring, 79 of the ewes in the negative group aborted, and on bacteriological examination only two of their 90 dead foetuses (2·4%) were found to be brucella-infected. Most of the remaining foetuses yielded cultures of a Gram-negative, polymorphous rod, and it was considered that the organism had spread in the flock and caused the abortions. It could not be identified, however, because the cultures died out.

These results, while admittedly preliminary, are considered to demonstrate the possibility of segregating brucella-free animals from infected flocks by serological or allegic tests, since the percentage of abortions due to brucella was reduced to 2·4 from between 37 and 48 in the infected group. During the same spring there were also 48% of abortions due to brucella in the group which gave " doubtful" reactions to melitin, demonstrating that agglutination reactions of 1 : 10 or 1 : 20 cannot be ignored. It is claimed that allergic tests were more reliable than agglutination tests.

TARASOV, I., & VERŠILOVA, P. (1937). Opyt sanacii brucelloznogo ovcevodčeskogo hozjaistva putem vydelenija otricateljno reagirujuščih životnyh allergičeskim metodom. [**An Experiment to Control Brucella Infection in Sheep Flocks by Isolating Animals with a Negative Reaction to the Allergic Test**].—*Brucellosis in Sheep.* pp. 387-398. 3 tables. Moscow: Viem Publ. Dept.

In the spring of 1935, an experiment was begun on the North Caucasus Experimental Sheep Farm, to reconstitute a healthy flock from a total of about 13,000 fine-fleeced sheep, in which serological (agglutination) and allergic (" brucellysate ") tests revealed a 68% brucella infection among the adult animals, 28% among the yearlings, and 14% among the lambs between six and seven months old. All the animals were first tested with " brucellysate " (0·5 c.c. for each adult and 0·4 c.c. for each younger animal, injected into the caudal fold), and

negative reactors were retested twice, one and five months later. The 5,732 sheep thus isolated were moved to a freshly established farm 22 km. away, and every precaution was taken to keep them from contact with infected personnel, cattle, and dogs (all of which were tested with " brucellysate "). Before admittance to the farm the sheep were shorn and passed through a disinfectant dip.

Of a total of 1,180 yearling ewes artificially inseminated on the new farm, only 0·25% aborted, and only 1·3% produced dead or non-viable lambs; bacteriological examination of the aborted foetuses or dead lambs and of their dams failed to reveal a single case of brucella infection. In the infected flocks, on the other hand, 4% of the 5,645 ewes in lamb aborted, and a further 4% produced dead or non-viable lambs, brucella infection being established in 59% of the abortion cases.

COTRUFO, P. (1937). Immunizzazione attiva sperimentale per via endovenosa con varii tipi di vaccini brucellari (vaccino lisato, vaccino formolato, vaccino fenicato). Contributo allo studio della vaccinoterapie endovenosa della setticemia di Bruce. [**Intravenous Vaccination against Brucellosis**].—*G. Batt. Immun.* **19.** 577-592. 1 table. [Numerous refs.] [English, French and German summaries].

C. experimented on immunization of animals with mixed brucella vaccines (*melitensis*, *paramelitensis*, and *abortus*) preparing the vaccines as follows:– (1) with phenol, (2) with formaldehyde, and (3) by a hydrolytic process and mixing with formaldehyde. The immunological reactions (phagocytic, bactericidal, agglutinating, and complement-fixing), and also general reactions shown by the test animals, convinced him that vaccine treated with formaldehyde had a decided advantage over that treated with phenol. The hydrolysed vaccine had good immunizing properties, but did not cause production of agglutinins. It possessed the advantage of being absolutely atoxic.—S. F. J. HODGMAN.

VOSKRESENSKIĬ, B., VERŠILOVA, P., & ŠTRITER, V. (1937). Opyty po immunizacii ovec protiv brucelleza ubitymi i oslablennymi kuljturami brucell. [**Experiments on Immunization of Sheep against Brucellosis by Killed and Attenuated Cultures**].—*Brucellosis in Sheep.* pp. 367-376. 5 tables. [9 refs.] Moscow: Viem Publ. Dept.

No increased resistance in sheep to experimental brucella infection was obtained by vaccinating them subcutaneously with heat- or formalin-killed cultures of various strains of brucella. Attempts to immunize the sheep with massive doses of living culture of Dubois's strain of non-virulent *Br. suis* or with attenuated *Br. melitensis* cultures also failed to give results of any practical significance.

VERŠILOVA, P. A. (1937). Vydelenie brucell s molokom, močoj i vaginaljnym sekretom u estestvebbo i eksperimentaljno zaražennyh ovec. [**The Excretion of Brucella in Milk, Urine and Vaginal Secretion Under Conditions of Natural and Experimental Infection of Sheep**].—*Brucellosis in Sheep.* pp. 95-105. 2 tables. Moscow: Viem Publ. Dept.

Milk, urine and vaginal secretion of 49 ewes naturally or artificially infected with *Br. melitensis* were tested for the presence of brucella, 5-100 days after parturition. Tests were made either by direct sowings on gentian violet-liver agar, or by injections into g. pigs and rabbits, which were then subjected to agglutination tests or to allergic tests with melitin, and finally killed and examined bacteriologically. While brucella cultures were obtained in only 8% of all the sowings made from the secretions or from the organs of the test animals, the aggl. and allergic tests were positive in

26%, 27% and 22% of the injections made with milk, urine, and vaginal secretion respectively, and V. suggests that the latter test is much more reliable. He also found that the excretion of brucella in milk, urine, or vaginal secretion was relatively " scanty ", for which reason the organism is not easily recovered by direct sowings. Excretion in the milk is further stated to take place most frequently and regularly during the first few days of lactation; in the urine it occurs during the initial period of infection or at times when latent or chronic infection is exacerbated; in the vaginal secretion it occurs during the first few days after abortion. The longest periods during which excretion of brucella was noted were :– in milk, 10 days from the beginning of lactation; in urine, 60 days after abortion, and in the vaginal secretion, 90 days after abortion. It is pointed out, however, that the excretion may occasionally last for much longer periods.

MATVEEV, S. (1937). Epidemiologija brucelleza v Krymu. [**An Epidemiological Study of Brucellosis in the Crimea**].—*Brucellosis in Sheep.* pp. 445-455. 5 tables. [16 refs.] Moscow: Viem Publ. Dept.

Investigations in the Crimea showed *Br. abortus* infection to be sporadic among persons having direct contact with cattle. *Br. melitensis* infection, on the other hand, was fairly prevalent both in the country and the towns, in the former from direct contact, and in the latter chiefly owing to the wide-spread consumption of fresh " brynza ", a cheese prepared from unpasteurized sheep-milk, from brucella-infected flocks. Until the installation of properly equipped cheese factories, where the milk can be pasteurized, M. recommends that the cheese should not be sold for at least 60 days after salting.

TARASOV, I. (1937). Aktivacija brucelleza u ovec pod vlijaniem ospy. [**Activation of Brucellosis in Sheep under the Influence of Sheep Pox**].—*Brucellosis in Sheep.* pp. 377-381. 2 tables. Moscow: Viem Publ. Dept.

During the summer and early autumn of 1935, a severe outbreak of an atypical form of sheep pox occurred among the experimental sheep flocks of the Brucellosis Commission in North Caucasus. Severe complications were encountered (poly-arthritis of the limbs, tendo-vaginitis, orchitis, peripheral paresis, etc.) which do not usually occur in sheep pox, but are commonly observed in sheep immediately after brucella abortion. Arthritis cases, in particular, occurred in 50-60% of the infected animals. On bacteriological examination of slaughtered sheep, brucella were recoverable from the internal organs of animals which had been infected with brucellosis for 5-20 months. From these observations T. is convinced that latent brucella infection in the sheep was activated under the influence of superinfection with sheep pox.

TARASOV, I. Eksperimentaljnoe zaraženie ovec brucellezom čerez kožnye i elizistyje pokrovy. [**Experimental Brucella Infection through the Mucous Membranes and the Skin**].—*Brucellosis in Sheep.* pp. 45-67. 4 tables, 2 appendixes. Moscow: Viem Publ. Dept.

T. confirmed the high susceptibility of sheep to infection with *Br. melitensis*, using a highly virulent strain originally isolated from a human being and passaged through sheep. The tests were made on 31 healthy sheep, chiefly merinos, imported to the North Caucasus Experimental Farm from brucella-free regions.

The minimum infective doses were 2×10^9 organisms given *per os*, 5×10^8 instilled in the eye, and 10^9 introduced with a gauze plug into the vagina, in direct contact with the os uteri. Further experiments showed that infection might also take place through the slightly scarified skin (of the groin), but doses of less than

from 2×10^7 to 10^8 organisms were ineffective. When the organisms were mixed to a thick paste with sheep faeces and maintained in contact with the skin for prolonged periods of time (24-48 hours) massive doses from 5×10^{10} to 10^{11} were necessary to set up infection. Five healthy sheep were kept in daily contact with infected animals from May to August (during which time no cases of abortion occurred among the infected sheep), and all remained healthy.

The results of special tests are claimed to have established that bacteraemia does not necessarily accompany *Br.m.* infection through the mucous membranes or the skin ; in T's tests it occurred in only 20 % of the cases, and that only during the acute stage (15-35 days after infection). As a rule, the agglutination reaction (with titres of 1 : 40 and higher) appeared 10-30 days after infection, but occasionally not for 45-50 days. The agglutination curve attained its maximum peak (95·2 %) towards the 30th day, falling off again after the 35th day. In general, the agglutination reaction varied in its intensity, fluctuations, and constancy from one animal to another, and was of small reliability for diagnostic purposes. The same was also true of the complement-fixation tests, the results of which, moreover, did not always concur with those of the aggl. tests.

Intradermal tests with " brucellysate", on the other hand, are claimed to have proved most reliable in diagnosis, giving clear, specific reactions in all the experimentally infected sheep during the first two months following infection. After 2-4 months, in a small percentage of the animals (not over 13 %) the reactions were often doubtful, especially after two or more tests, this may possibly have been due in part at least, to desensitization.

ŠTRITER, V. (1937). Vospriimčivostj jagnjat k brucelleza i ih immunizacije zivymi kuljturami brucell. [**The Susceptibility of Lambs to Brucellosis, and their Immunization by Living Brucella Cultures**].—*Brucellosis in Sheep.* pp. 351-365. 4 tables. [7 refs.] Moscow : Viem Publ. Dept.

Š. describes experiments at the North Caucasus Experimental Sheep Farm, in which 40 lambs, 7-120 days old were inoculated subcutaneously, through slight scarifications of the skin, or perorally, with massive doses (10^5 to 4×10^9 bacteria) of cultures of a virulent strain of *Br. melitensis.* Since it had been shown in preliminary experiments that neither haemoculture nor the agglutination test was entirely reliable in determining brucella infection in young lambs, all the experimental animals were slaughtered 15 days after inoculation, and their internal organs studied bacteriologically. Brucella could not be recovered from the organs of 13 of the lambs tested ; generalized infection was found in two cases, and in the remainder there was only localized infection, *i.e.*, of the lymph nodes nearest the point of inoculation. It is considered, therefore, that while lambs possess a higher degree of resistance to brucella infection than do adult sheep, this resistance is only relative, since it obviously decreased with the advancing age of the lambs, and generalized infection was established even in the youngest test animal by the administration of massive doses.

In further experiments an attempt was made to immunize 12- to 35-day-old lambs by subcutaneous injections of large doses of living cultures of a non-virulent or a slightly virulent strain of *Br.m.* The results were unsatisfactory in that the increase in natural resistance so obtained was only slight and very inconstant. From a practical standpoint, S. believes that, although young lambs are naturally more resistant than adult animals, the building-up of healthy flocks cannot be effected by the use of lambs removed between the ages of three and five months ; before being selected for this purpose, each individual lamb should be tested for infection by the allergic test with " brucellysate " [see *V. B.* **9.** 96].

PERVUŠIN, B. (1937). O metodah laboratornoĭ diagnostiki brucelleza ul čeoveka. [**On the Diagnosis of Brucellosis in Man by Laboratory Methods**].—*Brucellosis in Sheep.* pp. 303-338. 11 tables, 6 graphs. [Numerous refs.] Moscow: Viem Publ. Dept.

P. gives a detailed account of the results obtained by the North Caucasus Brucellosis Commission in the investigation from 1931 to 1935 of various laboratory methods for diagnosing human brucellosis. The infection was prevalent among the farm hands and other persons coming into contact with brucella-infected sheep on the Experimental Farm. The most reliable diagnostic methods were the agglutination together with allergic (melitin) tests, since in certain cases a patient might react positively to the one and negatively to the other; care must be taken in choosing the correct brucella strain in preparing the antigen for the aggl. test.

The preparation of blood cultures is discussed and the use of large amounts for seed material counselled.

TARASOV, I. (1937). Vospriimčivostj suslikov k brucellezu tipa melitensis. [**Susceptibility of Susliks to** *Br.m.*]—*Brucellosis in Sheep.* pp. 339-402. 1 table. Moscow: Viem Publ. Dept.

T. gives details of experiments which demonstrated the high susceptibility of the suslik (Siberian marmot) to experimental infection with *Br.m.*, both by subcutaneous injection and through the scarified skin. A month after infection, brucella were recovered from various internal organs of the animals, especially from the spleen, lymph nodes, and bone-marrow; the organisms were also demonstrated in the urine. The high susceptibility of this rodent, coupled with the fact that it reacts very readily both to the agglutination and to the allergic tests, renders it a useful laboratory animal for the demonstration of brucella infection. The possibility that the suslik might carry and distribute the infection among sheep and cattle in steppe regions, where it is very common, was supported by the finding of numerous naturally infected individuals in the region of the Experimental Sheep Farm in North Caucasus.

GRIEDER, H. (1937). Abortus Bang in Silberfuchsfarmen? [**Brucellosis on Silver Fox Farms**].—*Schweiz. Pelzgew.* **5.** 357-359.

G. refers to *Br. abortus* infection in dogs, and suggests that it may also be the cause of abortion and sterility on fox farms.—D. SLAVIN.

DI AICHELBURG, U. (1934). Agglutination aspecifique avec la fuchsine basique dans les microbes du groupe Brucella. [**Non-Specific Agglutination of** *Br. paramelitensis* **with Basic Fuchsin**].—*Boll. Sez. ital. Soc. int. Microbiol.* **6.** 30-32. [In French].

A. found that when equal amounts (0·5 c.c.) of a suspension of brucella in distilled water and of a 1 : 1,000 aqueous solution of basic fuchsin were mixed and incubated at 37°C., *Br.p.* was agglutinated within two hours, whilst *melitensis* and *abortus* were not agglutinated.

He recommends this as an additional differential test for *Br. paramelitensis*.
—J. E.

MASON, J. H., STEYN, H. P., & BISSCHOP, J. H. R. (1938). **The Immunization of Bovines against Lamsiekte.**—*J. S. Afr. vet. med. Ass.* **9.** 65-70. 3 tables. [2 refs.]

The experiments described in this article were carried out on some control cattle, during experimental work on the administration of phosphatic supplements

to cattle in the study of their influence on growth, reproduction, etc. As two types of *Clostridium botulinum* were known to occur on the farm, formol toxoids were made from both in horse flesh broth with meat particles and 2% horse serum. Incubation was carried out for seven days, followed by detoxication with 0·5% formalin until 0·25 c.c. was non-toxic for mice subcutaneously. Cattle received three doses of D toxoid and two of C at intervals of three weeks, the dose in each case being 10 c.c. (subcut.). No deaths occurred in these inoculated control animals, and judging by the antitoxin content of their sera, a satisfactory level was maintained. The immunity could be maintained by an annual inoculation of 10 c.c. of each toxoid.—E. M. Robinson.

Sterne, M., & Mason, J. H. (1938). **The Immunization of Guinea-Pigs against the Toxins of *Cl. Botulinum*, Types C and D.**—*J. S. Afr. vet. med. Ass.* **9.** 71-73. 4 tables. [2 refs.]

G. pigs were immunized against the toxins of the *Cl.b.* Types C and D by the use of formol toxoids. It was shown that with either toxoid several injections were necessary to immunize against one M.L.D. of the heterologous toxin. This supports previous experimental work [*V. B.* **6.** 582.] showing that there is a slight antigenic relationship between the toxins of the C and D types.—E. M. R.

Mason, J. H. (1936). **The Toxin of Clostridium Chauvoei.**—*Onderstepoort J. vet. Sci.* **7.** 433-482. 1 fig. on 1 plate, 18 tables. [Numerous refs.]

A toxin was demonstrated in filtrates of meat broth cultures of *Cl.c.* The most potent product was obtained when :- (1) the inoculum was a g. pig-passaged culture of the organism, (2) the medium (meat broth particle horse flesh broth) contained serum, haemolysed red cells and/or liver extract, and (3) the filtrate was precipitated with ammonium sulphate, with dialysis of the precipitate and drying of the resultant product. The best method of proving the presence of the toxin was the intradermal injection of g. pigs, particularly if adrenalin was incorporated in the toxin. In addition, the toxin was lethal, on intravenous injection, for the g. pig, mouse and sheep. A weak haemolysin was demonstrated, but was not proved to be the same, serologically, as the toxin.

The toxin was specifically neutralizable by antitoxin prepared in goats, sheep and g. pigs with the use of culture filtrates. In addition *Cl. septique* antitoxin neutralized it, but *Cl.c.* antitoxin had no effect on *Cl.s.* toxin.

A correlation existed between the total anti-toxin-binding value of a *Cl.c.* formol-filtrate (toxoid), the antitoxin stimulated into formation in an animal into which it was injected, and the resistance of the animal to the intradermal or intravenous injection of toxin. No correlation was shown, however, between the binding power of a toxoid, the antitoxin produced and the resistance to culture. Washed, boiled bacilli, and, to some extent, heated toxoid with no demonstrable toxin, did not stimulate the formation of antitoxin; the immunized animals did not resist toxin intradermally or intravenously, and yet were highly immune to the inoculation of culture.

The results tended to show that the heat-stable antigen was of more importance in the production of immunity to *Cl.c.* culture than the heat-labile toxin or toxoid.

I. Marinović, O. (1937). Smiju li enormna apoplektička ugibanja ovaca diljem države ostati i dalje etiološki neobjašnjena? Početno istraživanje parašuštavca ovaca u Jugoslaviji. [**Bradsot in Sheep in Yugoslavia**].—*Jugoslov. vet. Glasn.* **17.** 355-361. 2 tables. [German summary].

II. HUPBAUER, A. (1937). Parašuštavac (bradsot) kod ovaca u Jugoslaviji. [**Bradsot in Yugoslavia**].—*Vet. Arhiv.* **7.** 573-580. 2 figs., 1 table. [11 refs.] [German summary].

I. M. made a clinical investigation of deaths of sheep occurring in spring on the Dalmatian isle of Pag, Yugoslavia, the symptoms observed being sudden tympany, nervous disorder, profuse diarrhoea, dyspnoea, and death. Autopsy revealed distension of the stomachs and intestine, hyperaemia of the mesentery, enlargement of the liver with haemorrhagic infarcts, haemorrhages in the kidneys, subcapsular petechiae of the spleen, oedema of the lungs, petechiae on the pleura, and enlargement of the lymph nodes. M. suggested that bradsot might be the cause of the deaths.

II. H. made a bacteriological investigation of the above cases and isolated the bradsot bacillus, this being the first time that bradsot has been diagnosed in Yugoslavia.—B. OSWALD (KRIŽEVCI).

JANSEN, J. (1938). Over verwantschap tusschen boutvuur en paraboutvuur. [**The Relationships between Blackleg and Malignant Oedema**].—*Tijdschr. Diergeneesk.* **65.** 3-7. 3 graphs. [5 refs.] [English, French and German summaries].

Sixteen g. pigs vaccinated with formolized blackleg vaccine remained healthy when infected with a culture of *Clostridium chauveoi*, but they succumbed when infected with a culture of *Cl. septique*. In a second and third experiment on 47 guinea pigs immunized against *Cl.c.*, 46 died after infection with *Cls.*

—JAC. JANSEN (UTRECHT).

POZERSKI, E., & GUÉLIN, A. (1938). Contribution á l'étude des filtrats de quelques microbes anaérobies. Gélatinase et pouvoir escarrifiant. [**Filtrates of Some Anaerobic Bacteria. Gelatin Liquefaction and Scab-Forming Power in Guinea Pigs**].—*C. R. Soc. Biol. Paris.* **128.** 842-844. [1 ref.]

Thirteen strains of *Clostridium* species were classified into four groups by the amount of gelatinase in filtrates of anaerobic glucose broth cultures, as follows :– (1) Large : *Cl. histolyticum*, *Cl. sordellii*, *Cl. welchii*, *Cl. sporogenes* (bovine strain) and *Cl. sporogenes* (P.C.). (2) Small : *Cl. septique*, *Cl. welchii* (type D), and *Cl. bifermentans* (bovine strain). (3) Very small : *Cl. welchii* (type B), and *Cl. bifermentans H.* (4) None : *Cl. welchii* (type C), *Cl. oedematiens* and *Cl. aerofoetidus.* Scab-forming power was tested by injecting 1 c.c. of each filtrate subcutaneously into the shaved abdomen of g. pigs, and could not be correlated with gelatinase production.—R. O. MUIR.

MONNIER, & LEBASQUE. (1938). Les résultats de la vaccination du cheval contre le tétanos dans l'armée par l'anatoxine de Ramon. [**Vaccination of Army Horses against Tetanus with Ramon's Anatoxin**].—*Bull. Acad. vét. Fr.* **11.** 461-466. [2 refs.] [Also appeared in *Rev. Immunol.* **4.** 405-410].

The authors record the results obtained following the inoculation of army horses with Ramon's anatoxin. In 1929, 34,000 horses and mules were inoculated with two injections, at one month's interval, of 10 c.c. of anatoxin. Seven cases of tetanus occurred in two years, with four deaths, as against a previous annual occurrence of some 15 cases, with a higher percentage mortality, in the areas where the inoculations were performed. In 1931, a third injection was given in certain areas, and of 22,000 horses and mules vaccinated one case (non-fatal) was recorded as against a previous average annual occurrence of 0·45 per 1,000.

—S. J. GILBERT.

WOHLFEIL, T., & WOLLENBERG, H. (1937). Die Bedeutung der Bakterienurease für die Differentialdiagnose und Typenbestimmung pathogener Bakterien. **[The Importance of Bacterial Urease for the Differentiation of Pathogenic Bacteria].**—*Zlb. Bakt. I. (Orig.).* **140.** 281-288. 6 tables. [8 refs.]

The description of a new technique for detecting the presence of urea-splitting enzymes in bacteria. It is stressed that cultures should be tested for this urease immediately after isolation. It is reported that all species of *Brucella* were positive for urease; tubercle bacilli and *Clostridium* were negative; *Pasteurella septica* and *Past. pseudotuberculosis* were variable, but *Bacterium tularense* was negative; staphylococci were variable. Observations are recorded which suggest that staphylococci containing urease generally produce chronic infections.—E. J. PULLINGER.

ANON. (1938). Streptothricose cutanée. **[Cutaneous Streptothricosis].**—*Bull. Serv. zootech. Epiz. A.O.F.* **1.** No. 3. 65.

In the Belgian Congo the best treatment for cutaneous streptothricosis is considered to be the application of 10% phenol ointment. Bathing with a lotion consisting of 3 g. picric acid and 3 g. copper sulphate to one litre water has also been found useful as a control measure.

MALFROY. (1938). La streptothricose cutanée chez les bovins de l'office du Niger. **[Cutaneous Streptothricosis in Bovines in the Niger Colony].**—*Bull. Serv. zootech. Epiz. A.O.F.* **1.** No. 3. 15-16. [1 ref.]

Skin affections of animals are common in French West Africa, especially in the winter. Streptothricosis is a frequent cause of skin disease in cattle; commencing usually at the withers, it may spread over all the body and cause serious losses by injury to the hides, or by illness and death of affected animals. It is stated that in the last few years these losses have greatly decreased following the use of a cheap and effective treatment [described in the previous abstract]. Treatment should be begun at an early stage of the disease.—S. J. GILBERT.

DISEASES CAUSED BY PROTOZOAN PARASITES

PARKIN, B. S. (1937). **Auto-Sterilization in Trypanosomiasis.**—*Onderstepoort J. vet. Sci.* **10.** 21-27. 2 tables. [7 refs.]

This is a record of the occurrence of auto-sterilization in a number of sheep and cattle with *Tryp. congolense* and *Tryp. vivax* infections, together with an account of the methods employed to determine whether sterilization had taken place or not. No cases of auto-sterilization were observed in *Tryp. brucei* or *Tryp. equiperdum* infections of equines. In *Tryp. congolense* infections, some of the animals concerned showed the presence of the parasites for considerable periods of time before the animal body obtained the upper hand and the animals thus became sterilized.

VAN HOOF, L., HENRARD, C., & PEEL, E. (1938). **The Stability of Bayer 205 Resistance in** *Trypanosoma gambiense.*—*Trans. R. Soc. trop. Med. Hyg.* **32.** 197-208. [3 refs.]

Drug-resistance of *Tryp. gambiense* to Bayer 205 is an unstable character which progressively decreases on mechanical passage through mammals of the same species, decreases still more rapidly on mechanical passage through mammals of different species and even completely disappears on cyclical transmission through *Glossina palpalis.* In the epidemiology of Gambian sleeping-sickness, resistance

to Bayer 205 is of considerably less importance than the corresponding arsenic resistance.—J. M. ROBSON.

CORSON, J. F. (1937). **A Note on the Infectivity to Man of a Strain of *Trypanosoma rhodesiense* Maintained in Sheep.**—*J. trop. Med.* (*Hyg.*). **40.** 141-142. [1 ref.]

CORSON, J. F. (1937). **A Second Note on the Infectivity to Man of a Strain of *Trypanosoma rhodesiense*: Resistance of Two African Volunteers to Infection.**—*Ibid.* 263-266. [7 refs.]

CORSON, J. F. (1938). **A Third Note on the Infectivity to Man of a Strain of *Trypanosoma rhodesiense*: Two Further Passages through Antelopes and Tests on Volunteers.**—*Ibid.* **41.** 125-128. [10 refs.]

These papers give C's observations on a strain of *Tryp. rhodesiense* transmitted by *Glossina morsitans* from man to sheep in 1934, maintained in sheep by fly passages for two years, and finally retransmitted to man in 1936 and 1937 (as described below). Two experiments on four volunteers were made, in each of which a single *G.m.* failed to infect one volunteer and afterwards infected another. There was no indication in control animals of loss of virulence of the trypanosome during the three years.

It is suggested that many people are bitten by infected flies without becoming infected, that cases in which infection is not apparent may not be rare, and also that some people may recover spontaneously. All the experimental transmissions were made with *G.m.*, and their main interest is that they demonstrate the persistence of infectivity for man in some of these trypanosome strains over a period of more than three years, after many cyclical passages through ruminant animals which may become infected under natural conditions and spread the disease. In all 13 experimental infections in man, the syringe being used in four, there was a definite swelling at the site of inoculation, whether this was by tsetse fly or the syringe needle; this contrasts with DUKE's observation [*V. B.* **5.** 705.], where 12 out of 17 infected volunteers showed no local reaction. No local reaction was noted when infection failed after a tsetse fly bite. C. emphasizes the importance DUKE [*V. B.* **4.** 792.] attached to the use of tsetse flies in preference to the syringe in transmission experiments.—J. A. GRIFFITHS.

DEBONERA, G. (1938). La dourine en Grèce. [**Dourine in Greece**].—*Rec. Méd. vét.* **114.** 459-468.

There is little doubt that dourine has long existed in Greece as well as in neighbouring countries, but was recently seriously investigated when it occurred in Thessaly in 1935. In this area more than 300 clinical cases were examined, and in 72% of them the organisms were demonstrated microscopically. In 1937, an area of infection was found in the plain of Salonica, and of 2,350 complement-fixation tests, 504 proved positive, including material from 121 animals which showed clinical symptoms.

About 16,000 c.-f. tests have been completed at the Athens laboratory. The trypanosome is of the European type and is difficult to convey to small laboratory animals. The symptoms observed differed from classical descriptions of the disease, being usually confined to the genital organs. Abortion and depigmentation of the skin were common. Plaques were only occasionally observed, and only five out of 300 cases could be described as severely affected. The majority of positive reactors were clinically healthy. In the c.-f. test an African strain of *Tryp. equiperdum* is used to inoculate g. pigs in preparing antigen. The g. pigs are bled by cardiac puncture and the antigen is then prepared by Watson's method. Horse

sera are inactivated at 60°C. for one hour, and donkey sera at 60°C. for one hour and 3-4 days later at 62°C. for half an hour.

Treatment with sub-toxic doses of neosalvarsan according to Ciuca's method [*V. B.* **4.** 568.] generally effected no change in the titre of the sera of affected animals.—S. J. GILBERT.

I. DONATIEN, A., & LESTOQUARD, F. (1938). Remarques sur l'évolution de la leishmaniose générale du chien. [**Generalized Leishmaniasis in Dogs**].—*Bull. Soc. Path. exot.* **31.** 214-216. [2 refs.]

II. DONATIEN, A., & LESTOQUARD, F. (1938). Observation d'un cas de leishmaniose générale du chien accompagnée de néoplasie. [**Generalized Leishmaniasis and Neoplasia in a Dog**].—*Ibid.* 217-220. [3 refs.] [Also appeared in *Arch. Inst. Pasteur Algér.* **16.** 203-209].

III. LESTOQUARD, F., & DONATIEN, A. (1938). Parasitisme de la matrice unguéale dans la leishmaniose générale du chien. [**Parasitism of the Claw Matrix in Dogs with Generalized Leishmaniasis**].—*Ibid.* 483-487. [See also *V. B.* **6.** 647].

IV. JOYEUX, C., & SAUTET, J. (1938). Observations sur la leishmaniose canine méditerranéenne. [**Canine Leishmaniasis in the Mediterranean Regions**].—*Ibid.* 487-490.

V. PIGOURY, L. (1938). Observation prolongée d'un cas de leishmaniose du chien ; remarques sur les symptômes et le traitement par l'anthiomaline. [**Observations on Canine Leishmaniasis. Treatment with Anthiomaline**].—*Rec. Méd. vét.* **114.** 216-220. [8 refs.]

I. Dogs with leishmaniasis may not show clinical symptoms for over one year although they may be heavily parasitized. This latent period was most noticeable in the cold weather, but was present to some extent in all cases. The disease may be fatal, or there may be temporary or prolonged clinical recovery with liability to relapse. From observation of natural and experimental cases the authors considered that reinfection was possible. Prophylaxis should therefore include the examination of all dogs as possible reservoirs of the disease, and early detection of the latent period would greatly aid therapeutic measures.

II. The history of a case of canine leishmaniasis lasting for five months, skin lesions being the first sign. Generalized adenitis with gross enlargement of the lymph nodes was a marked feature from the start and the size of the lymph nodes fluctuated in the course of the infection. Nodular subcutaneous lesions leading to skin ulceration (as in kala-azar) were present. These contained parasites, and at first followed the same varying course as those in the lymph nodes. Later, malignant characters developed. P.M. examination proved the lesions to be neoplastic. The authors suggest that overstimulation of the reticulo-endothelial system in this heavily parasitized animal caused the hyperplasia leading to generalized neoplasia.

III. The authors have previously reported that the abnormal growth of the claws of dogs affected with leishmaniasis is due to parasitism of the claw matrix. They now describe a technique for the preparation of smears from the claws for diagnostic examination. The claws are gradually pared down by sharp cutters until the junction of the horn with its matrix is reached when some serous fluid will exude or slight pressure will furnish sufficient for a smear preparation. (Any bleeding will impede a search for the parasites). They claim that positive cases always yield positive smears.

In a discussion on this paper it was pointed out that apparently healthy skin is also useful material for examination of the parasites in suspected cases.

IV. The authors fed 12 *Triatoma infestus* (Kluge) and 200 *Rhipicephalus sanguineus* larvae on a dog affected with leishmaniasis; no evolution forms of leishmania were present in either of the arthropods. They next studied by skin examinations the course of parasitism in this dog (which became infested with lice) and at the same time assessed the varying number of lice and the proportion of lice which became " parasitized ". Definite evolution forms of leishmania (those in process of simple division and flagellate forms) were found in the digestive tract of the lice, but no cyst forms were found. The lice left their host progressively as the skin lesions developed.

The authors suggest that lice may be secondary hosts of *L. canis*.

V. This is the clinical history of a case of canine leishmaniasis which was under treatment from December, 1934 to July, 1937, with anthiomaline (intraven. and intramusc.). Dosage varied from 1 c.c. to 3·5 c.c. of a 6% solution, and was irregularly spaced according to tolerance.

The dog was eventually destroyed. At autopsy no parasites could be demonstrated, but the spleen was irregularly sclerotic, and there was chronic nephritis.

Several cases of leishmaniasis of children were encountered in the same village.—C. V. Watkins.

Sánchez Botija, C. (1936). Leishmaniosis canina. Algunas observaciones sobre los caracteres generales del foco endémico- en Madrid. **[Canine Leishmaniasis in Madrid]**.—*Trab. Inst. Biol. anim. Madr.* **4.** 70-87. 3 figs., 1 table. [Also appeared in *Rev. Hig. Sanid. pecuar.* **26.** 148-158].

The author examined 2,230 dogs of Madrid for leishmaniasis during 1935, and found 178 cases (7·9%). Half the affected animals had cutaneous lesions, most of which were visible on naked eye inspection, but some were only found by microscopic examination. Diagnosis in general was based on clinical examination, on microscopic biopsy, and on the formol gelification test. A general clinical account is given.

Malbrant, R. (1938). Piroplasmoses du Congo français. **[Piroplasmoses in the French Congo]**.—*Bull. Soc. Path. exot.* **31.** 599-603. [2 refs.]

Blood films from cattle with anaemia and enlarged lymph nodes were examined at the Pasteur Institute of Algiers, and *Theileria parva*, *Th. mutans* and *Anaplasma marginale* were identified. Anaplasms were observed in the blood of sheep at the experiment station of the Pasteur Institute at Brazzaville in an outbreak in which five lambs and one sheep succumbed. A number of adult healthy sheep were found to be carriers, but symptoms were only observed in sheep from the province of Linzola.—S. J. Gilbert.

Neitz, W. O. (1938). **The Destruction of *Piroplasma canis* by the Neutrophiles and Large Mononuclear Leucocytes.**—*Onderstepoort J. vet. Sci.* **10.** 33-36. 3 figs., 1 table. [9 refs.]

A case of biliary fever is reported in which *P.c.* was phagocytosed by the large mononuclear leucocytes and neutrophiles. In contradistinction to the activity of the mononuclears which ingested the parasites and their host cells, the neutrophiles were concerned with the destruction of the extracellular parasites.

Coles, J. D. W. A. (1937). **A New Blood Parasite of the Fowl.**—*Onderstepoort J. vet. Sci.* **9.** 301-307. 10 figs. [11 refs.]

C. describes an apparently new blood parasite of the fowl in New York and Philadelphia. It is intra-erythrocytic and about one-third the size of *Aegyptianella*

pullorum, which it most closely resembles. The virulence seems to be very low. A similar, if not identical, organism occurs in South Africa.

MIESSNER, H., & DEDIÉ, K. (1937). Leptospirosis bei Silberfüchsen. [**Leptospirosis in Silver Foxes**].—*Dtsch. tierärztl. Wschr.* **45.** 809-818. 6 figs., 2 tables. [Numerous refs.] [Résumé published in *Dtsch. Pelztierz.* **13.** 25].

The authors record investigations, on seven farms, into a disease of silver foxes which is prevalent in the Hanover area between June and October. Though on most farms the losses are small, on two they reached 40% and 45% respectively of the season's whelps. The P.M. findings were very similar in all cases, consisting of jaundice, punctiform haemorrhages in the lungs, degeneration of the liver, slight enlargement of the spleen, haemorrhages in the bladder, and catarrhal inflammation of the stomach and intestines. In only one case was the presence of leptospira proved by subinoculation, although four g. pigs and 12 mice were inoculated with blood, organ suspensions and urine. Leptospira could not be detected in the blood by dark-ground illumination, though in one case they were demonstrated by blood culture. The organisms were occasionally detected in the urine of sick and recovered foxes, but in all cases they had lost their motility. It is stated that leptospira were detected in sections of lung or kidney, stained by Levaditi's method, in all cases in which the preparation of sections was undertaken. [The number of animals examined by this method is not given]. In one experiment, kidney material from a recovered fox produced leptospiral infection when inoculated into g. pigs and when fed to another fox caused fever, jaundice and death.

The disease in foxes is said to occur in a peracute form, characterized by meningitis and death in about two days, in an acute form characterized by jaundice and emaciation, and in a latent form, with slight jaundice and some loss of appetite.

The epidemiology of the disease is discussed, and the authors point out that it may be contracted by eating rats or through contact with water infected by rats. The condition is peculiar in that only one or two foxes out of a number in a pen may contract it, and that cases occur irregularly throughout the pens without any particular tendency to spread to the pens nearest the original outbreak. The possibility of foxes carrying infection is discussed, but in no cases has the urine been proved infective, and it appears that fox urine is too acid to allow any prolonged survival of leptospira. Agglutination tests carried out with serum from a few recovered foxes and various strains of leptospira indicated that the disease was due to the classical *L. icterohaemorrhagica*, the cause of Weil's disease in man.—U. F. R.

KLARENBEEK, A., & WINSSER, J. (1938). De leptospirosen bij de kleine huisdieren. Een statistisch en experimenteel onderzoek. [**Leptospira in Small Domestic Animals**].—*Tijdschr. Diergeneesk.* **65.** 666-670. 5 tables. [5 refs.] English, French and German summaries].

Of 76 dogs taken at random and examined serologically for leptospirosis, 35 were positive; in ten cases the infection was by *L. icterohaemorrhagiae* and in 25 cases by *L. canicola*. A difference was noted between the disease caused by the two types, icterus nearly always occurring in the adult animals infected with *L.i.*, but rarely in connexion with *L.c.* Experimental subcutaneous infection in pups produced icterus in almost all cases with both strains.

In experiments in young cats, *L.i.* caused a slight but specific serum reaction and the *canicola* strain gave rise to a high blood titre; the organisms of the latter strain appeared in the urine.—JAC. JANSEN (UTRECHT).

DISEASES CAUSED BY VIRUSES

FREI, W. (1938). Neuere Ergebnisse der physikalisch-chemischen Erforschung filtrabler Vira. [**Physico-Chemical Investigations on Filtrable Viruses**].—*Z. InfektKr. Haustiere.* **53.** 253-278. [Numerous refs.]

An interesting discussion regarding the identity of viruses. The information regarding molecular size which may be obtained by the differential centrifugation technique is considered and the recent work done with the virus of tobacco mosaic disease is used as an example. The nature of viruses is then discussed under the following headings :– response to pH, resistance to disinfectants and radiations, adsorbability, antigenicity, plurality of types and infectivity (*i.e.*, the size of the dose which is capable of producing infection). Under the heading " The Origin of Viruses ", F. discusses the hypothesis of spontaneous generation of viruses.
—E. J. PULLINGER.

PAIC, M., KRASSNOFF, D., HABER, P., REINIÉ, L., & VOET, J. (1938). Dimensions approximatives des ultravirus et des bacteriophagès d'après les données fournies par l'ultrafiltration. [**Sizes of Viruses and of Bacteriophage as Calculated from Ultrafiltration**].—*Ann. Inst. Pasteur.* **60.** 227-269. 11 figs., 7 tables. [Numerous refs.]

The authors describe the development of the ultrafiltration method of measuring virus particle size, with special reference to their own work. They discuss the value of the ultrafiltration method, and stress the fact that in the measurement of the size of small particles the medium in which these are suspended may influence filtration. A table of approximate sizes of viruses is given, the suspending medium being stated in each case, but it is pointed out that these sizes are approximate only, and may be subject to greater variation than is generally realized.—E. J. P.

WALDMANN. (1937). " Maul- und Klauenseucheeinbruch in Deutschland ". [**Foot and Mouth Disease in Germany in 1937**].—*Dtsch. tierärztl. Wschr.* **45.** 711.

ANON. (1937). Abwehr gegen Maul- und Klauenseuche. [**F. & M. Disease in Germany in 1937**].—*Ibid.* 738-739. [1 ref.]

HIMMEL. (1937). Der Einbruch der Maul- und Klauenseuche. [**The Outbreak of F. & M. Disease in Germany, 1937**].—*Dtsch. Tierärztebl.* **4.** 493.

All three papers cover the same ground and concern the recent pan-European outbreak.

The importation of sheep from North Africa to France was responsible for the European outbreak of 1937. The disease spread eastwards through Alsace to Germany, and 3,500 premises were involved between September and November. The infection was of Type A ; the virus was found to be extremely infective, the incubation period being about 24 hours. Heart lesions were not observed, and the virus was considered to have a medium degree of virulence. Secondary lesions in the feet were observed earlier than in previous outbreaks due to Type A.

Strong veterinary-police measures succeeded in arresting the spread of infection after three months. The importation of hay, straw and meat was prohibited, and communication between infected premises was reduced to a minimum by the closing of markets, schools and churches. The hyperimmune Type A serum was found to be of great value.—E. C. HULSE.

NAGEL, H. C. (1937). Untersuchungen über das Verhalten des Maul- und Klauenseuche-Virus im Zentralnervensystem kleiner Versuchstiere. [**Foot and Mouth Disease in the Central Nervous System of Small Animals**].—*Dtsch. tierärztl. Wschr.* **45.** 624-625. [9 refs.]

The g. pig was found unsuitable for work on transmission by brain infections, but 125 passages through brains of white mice increased the virulence of the virus. During the course of the passages, the virus was detected by g. pig inoculation in the blood, lungs, liver, spleen and spinal cord, as well as in the brain tissue. No clinical or pathological changes were observed in the mice, and the histological changes were limited to a hyperaemia of the meninges, an increase of cerebrospinal fluid, and a round cell infiltration of the cortex.—E. C. HULSE.

I. JOLTRAIN, E. (1938). Stomatite aphteuse humaine probable. Contagion de l'animal à l'homme. Chimiothérapie. [**A Probable Case of Foot and Mouth Disease Stomatitis in Man**].—*Rev. Path. comp.* **38.** 792-796.

II. FISCHER, G. (1938). La fièvre aphteuse des animaux peut être transmise à l'homme. [**Transmissibility of Foot and Mouth Disease to Man**].—*Arch. internat. Brucelloses.* **1.** 112-116.

I. The author records a possible case of infection in man with the virus of F. & M. disease, due to the ingestion of milk, and also white cheese, from an affected cow.

II. F. gives a list of the animals susceptible to F. & M. disease. He reviews four groups of cases occurring in man during the past century. The condition in human beings is described, and the probable causes of infection are pointed out.
—G. DODS MUNRO.

MORNET, M. (1938). Un cas de fièvre muquese africaine du boeuf (snotsiekte). [**Malignant Bovine Catarrh in French West Africa**].—*Bull. Serv. Zootech. Epiz. A.O.F.* **1.** No. 1. 11-12.

Malignant bovine catarrh is said to be rather rare in French West Africa. M. gives a case record of an affected bull.—N. J. SCORGIE.

I. NAKAMURA, N., ISHII, S., & WATANABÉ, S. (1938). Étude sur le virus de l'anémie contagieuse du cheval. Observations expérimentales sur la répartition du virus dans plusieurs organes au cours de formes évolutives non fébriles de la maladie. [**Distribution of the Virus of Equine Infectious Anaemia in the Organs during Non-Febrile Periods**].—*Bull. Off. internat. Epiz.* **16.** 149-160. Discussion pp. 390-392.

II. NAKAMURA, N., ISHII, S., & WATANABÉ, S. (1938). Étude sur les lésions histo-pathologiques provoquées chez le cheval par l'anémie infectieuse. I. Quelques observations sur le système nerveux. Cerveau et moelle épinière. II. Quelques observations sur les lésions histopathologiques du testicule. [**Histopathological Lesions in E.I.A. I. The Central Nervous System. II. The Testicle**].—*Ibid.* 161-180. 22 figs. on 6 plates, 2 tables. Discussion pp. 390-392.

I. A series of normal horses inoculated with the virus of E.I.A. were killed at various stages of the disease. Selected tissues were injected into fresh susceptible animals in order to determine the distribution of virus.

It was clearly shown that the virus was always present in the bone-marrow, for which it appeared to possess a special affinity. It was also recovered from the blood, liver and spleen, but not with regularity. The C.N.S., on the other hand, was invariably affected. The authors do not, however, regard the causal agent as a neurotropic virus, but consider that the C.N.S. is a particularly favourable site for its conservation.

II. The C.N.S. of horses artificially infected with the virus of E.I.A., together with natural cases, was subjected to a detailed histological examination. The

main changes noted in the brain were a proliferation of the neuroglial cells, a migration of leucocytes around the cerebral blood vessels, and a perivascular cellular infiltration which was most marked in the later stages of the disease. Various degrees of neuronophagia were noted, the cell degeneration in the spinal cord being particularly marked.

Cytoplasmic and nuclear inclusion bodies were found in the Purkinje cells and elsewhere, but they were very small (0·25-0·1 of the diameter of the nucleus).

It is suggested that the virus of E.I.A. in the early stages exerts a powerful action on mesodermic tissue, stimulates the blood vessels and increases the numbers of histiocytes : later it attacks the ectodermal tissue.

The examination of testicles from affected horses revealed a syndrome which the authors attribute to the action of the virus. The first change was a degeneration of the germinal cells which took the form of pycnosis or caryolysis. The capillaries were dilated and the interstitial tissue was hyperaemic. After an animal had passed through two or three febrile crises, however, an acute interstitial reaction was produced which was characterized more by degenerative than by proliferative changes. There was an accompanying reaction in the form of an infiltration of mononuclear and histiocytic cells collected into well-marked centres. In some instances the cells of Sertoli were more or less normal, but in others they showed a severe and rapid necrosis.

In the terminal stage there was a massive cellular infiltration of the interstitial tissues leading to the production of fibrous tissue and accompanied by a marked atrophy of the organ.—R. E. Glover.

Pigoury, L., Borde, R., & Bernard, M. (1938). Intensité du syndrome anémie dans le surra expérimental du cheval. Comparaison avec l'anémie infectieuse. [**Intensity of Anaemia in Experimental Surra. Comparison with Equine Infectious Anaemia**].—*Bull. Soc. Path. exot.* **31.** 622-626. [6 refs.]

The symptoms, evolution and lesions of acute E.I.A. and surra are almost identical. Two horses were inoculated with *Trypanosoma evansi* isolated from an epidemic of surra in Syria and a comparison was made on them of tests applied for the diagnosis of E.I.A. The tests carried out were blood sedimentation, coagulation, the mercuric chloride, albuminuria, and the presence of haemosiderin in the liver. Except for the absence of a true albuminuria in surra, the results obtained in these tests were identical in both diseases. A positive c.-f. test for *Tryp. evansi* in the absence of this parasite would indicate a dourine infection. It is possible for E.I.A. and surra to occur simultaneously in the same animal, but surra should yield to treatment with naganol and trypoxyl, or with naganol and antithiomaline, which have proved fully effective in Syria.—S. J. Gilbert.

Webster, L. T., & Wright, F. H. (1938). **Recovery of Eastern Equine Encephalomyelitis Virus from Brain Tissue of Human Cases of Encephalitis in Massachusetts.**—*Science.* **88.** 305-306. 2 tables. [3 refs.]

In the autumn of 1938 there was a bad outbreak of eastern type equine encephalomyelitis in Massachusetts, and simultaneously some cases of fatal encephalitis occurred in children. The authors received brain tissue from the latter and succeeded in transmitting a rapidly fatal encephalitis through four passages in Swiss mice, as well as through other animals. The results corresponded closely to those obtainable with the eastern equine encephalomyelitis virus. Finally virus neutralization tests, using antiserum prepared against the latter virus, showed that the virus from the children's brains was the equine encephalomyelitis virus of the eastern type. The antiserum was capable of protecting mice against 10^3

M.L.D. intracerebrally. This is the first proof of the occurrence of equine encephalomyelitis infection in man.—J. E.

KELSER, R. A. (1937). **Transmission of the Virus of Equine Encephalomyelitis by** *Aedes taeniorhynchus.—Science.* **85.** 178. [1 ref.]

The Western type of equine encephalomyelitis can be passed from g. pig to g. pig by *A.t.*—in one case production of the disease and death occurred within five days. There is no proof as yet that the Eastern type can be so transmitted. Details of the experiment were published in a later article [below].—G. W.

I. KELSER, R. A. (1938). **Transmission of the Virus of Equine Encephalomyelitis by Aedes Taeniorhynchus.**—*J. Amer. vet. med. Ass.* **92.** 195-203. 1 table. [7 refs.]

II. TRAGER, W. (1938). **Multiplication of the Virus of Equine Encephalomyelitis in Surviving Mosquito Tissues.**—*Amer. J. trop. Med.* **18.** 387-393. 1 table. [14 refs.]

I. Transmission experiments in Panama incriminated *A.t.* as a vector of equine encephalomyelitis virus. Only the western type of the virus was transmitted, however, experiments with the eastern type giving negative results in all cases.

Although accurate recordings were impossible, it appears that the virus undergoes some change within the mosquito. Transmission is not mechanical, and time, therefore, is required after the ingestion of virus-containing blood before infection of a clean host is possible. Such a period appears to be longer in *A.t.* than in other *Aedes* species.

Determination of the duration of infectivity of the mosquito in question was impossible owing to the difficulty in keeping it alive in captivity for extended periods, but a few surviving mosquitoes were still infective after 32 days.

A short report of earlier work on the relationship of western type virus to *A. vexans* is incorporated. It would appear that this species is also capable of transmitting the virus.

II. An account is given of the behaviour of the western strain of the virus of equine encephalomyelitis in the presence of tissues of *A. aegypti.* The mosquitoes were reared under aseptic conditions, and a number of tissues from them were explanted to a nutrient solution to which heparinized g. pig or chicken plasma had been added.

A strain of the virus was maintained by mouse brain passage, and virus cultures were commenced from this source. Titration by intracerebral inoculation of recently weaned mice followed.

Best results were obtained with a series started in larval thoracic tissue, subcultured to pupal head tissue in seven days, reinoculated to larval thoracic tissue seven days later, sub-cultured again to pupal head tissue in seven days, and finally tested after a further seven days, when a titration 100,000 times higher than the original suspension was recorded. The virulence and serological properties of the virus remained unchanged.

Relatively poor results were afforded by the other tissues employed.—D. D. O.

DONATIEN, A., & LESTOQUARD, F. (1938). Nouvelles recherches sur l'intradermoréaction dans la peste porcine. [**Various Applications of the Intradermal Test for Swine Fever**].—*Bull. Acad. vét. Fr.* **11.** 308-316. 1 table. [3 refs.]

Using the intradermal technique previously described [*V. B.* **8.** 436.], the authors examined 103 samples of blood from suspected outbreaks of S.F. and from normal animals, and confirmed the high accuracy of the test. The presence of

various secondary organisms, *e.g.*, *Salmonella cholerae-suis* and *Erysipelothrix rhusiopathiae*, does not invalidate its accuracy. The interpretation of the reactions requires considerable experience and should not be undertaken by practitioners.

The intradermal reaction is also of value in detecting differences in the antigenic value of strains of S.F. virus. Strains which induce poor skin reactions are unsuitable for the preparation of hyperimmune sera. The titration of unknown sera by this method is also described.—R. E. GLOVER.

—. (1938). **Report of the Committee on Rabies. [U.S. Live Stock Sanit. Ass.]** —*J. Amer. vet. med. Ass.* **92.** 307-310.

It is recommended that strict measures of quarantine, vaccination and the destruction of stray dogs should be enforced in all States. The control and eradication of rabies should be under the direction of the federal government in co-operation with the state governments, and there should be close co-operation between the medical and veterinary professions.

More outbreaks of rabies were reported in Illinois than in any other state. Of 1,528 heads examined, 581 were positive; three human deaths occurred, and 4,475 treatments were issued. It is estimated that there are approximately one million dogs in Illinois alone.

Vaccination alone did not prove satisfactory in the control of rabies except in those areas where the greater part of the dog population had been vaccinated. —E. C. HULSE.

BALOZET, L. (1937). La vaccination antirabique des animaux en Tunisie du 1er janvier au 31 décembre 1936. **[Antirabies Vaccination of Animals in Tunis during 1936].**—*Arch. Inst. Pasteur Tunis.* **26.** 424-429. 1 table. [5 refs.]

Statistics are given of the antirabic vaccinations performed during 1936. Approximately 2,000 dogs were vaccinated, including 38 that were so dealt with after they had been bitten; no cases of rabies were reported following this treatment. From 1931 to 1936, 31 horses were vaccinated, of which one subsequently died of rabies; 32 cattle and one camel were also treated, with no subsequent losses.—E. C. HULSE.

I. BERNKOPF, H., & KLIGLER, I. J. (1937). **The Cultivation of Rabies Virus in Tissue Cultures.**—*Brit. J. exp. Path.* **18.** 481-485. [5 refs.]

II. SCHLEIFSTEIN, J. (1937). **A Rapid Method for Demonstrating Negri Bodies in Tissue Sections.**—*Amer. J. publ. Hlth.* **27.** 1283-1285. [17 refs.]

III. BERTONI, G. (1938). Sur la méthode classique de Pasteur pour la vaccination antirabique. **[Pasteur's Classical Method for Rabies Vaccination].**—*Ann. Inst. Pasteur.* **60.** 189-194. 1 table. [13 refs.]

IV. LÉPINE, P., & SAUTTER, V. (1938). Etat du virus fixe dans les vaccins antirabiques phéniqués. **[State of Fixed Rabies Virus in Phenol Vaccines].** —*C. R. Soc. Biol. Paris.* **127.** 192-194. 1 fig. [3 refs.]

I. Fixed rabies virus was cultivated *in vitro* in mouse embryo brain medium. Serial sub-cultures were maintained in chicken plasma with tyrode-rabbit serum; human serum improved the growth. At the seventh sub-culture the virus was infective for rabbits at a dilution of 1 : 100. When monkey serum was used for mass cultures, the virus increased in virulence up to the seventh culture; it was avirulent by the 20th. Formalin (1 : 1,000) inactivated the cultures after one hour at 37°C., and in 48 hours in the refrigerator,

II. The section is fixed in Jenker's solution for four hours. Paraffin sections are prepared with the use of dioxan and are then stained with a modified Wilhite stain. The time taken from the removal of the brain to the completion of the sections is about eight hours. The Negri bodies are stained a deep magenta red colour, contrasting with the bluish violet of cytoplasm and the copper colour of red blood cells.

III. Since the introduction of the original Pasteur technique, the fixed virus has undergone considerable modifications in its ability to resist desiccation. At some Institutes the virus is now avirulent after four days. B. briefly reviews various aspects of this variation ; he suggests that glycerin may have some toxic action on the virus when it is used as a preservative of the dried cords.

IV. Although a phenolized vaccine may be avirulent for rabbits by subcutaneous inoculation immediately after preparation, it is virulent for 6-10 days when inoculated intracerebrally. Rabbits thus inoculated show typical nuclear lesions near the site of inoculation and especially in the neurones of Ammon's horn. It would appear that the fixed virus forms a stable complex with the phenol and that this constitutes a safe method for the attenuation of the virus.—E. C. H.

VIRGA, E. (1938). Sulla virulenza e sulla resistenza ai vari agenti di attenuazione del virus rabbico fisso. [**The Virulence and the Resistance to Attenuating Agents of Fixed Rabies Virus**].—*G. Batt. Immun.* **20.** 47-63. [Numerous refs.] [English, French and German summaries].

V. reports that the fixed rabies virus at the Palermo Institute has been passaged 2,687 times, and is no longer virulent to rabbits on subcutaneous injection, but is still virulent when given by nerve, eye or skin ; it resists drying for 7 days, glycerin for about 2 months, contact with ether for 10 days and contact with phenol for 11 days.

These results differ from those of REMLINGER in that the virus he examined showed little or no resistance to glycerin or drying. In view of this and the fact that other workers have reported differences in the virus maintained at their Institutes for the production of vaccines, V. suggests that Institutes producing antirabies vaccine should issue a yearly report on the virulence and other properties of the virus used in order that the results of vaccination may be compared.
—J. A. NICHOLSON.

NAIDU, P. M. N. (1938). **Rabies Prophylaxis in Dogs with Special Reference to the Development of the Single Injection Method in Mysore.**—*Indian vet. J.* **15.** 21-28. 3 tables.

N. states that [? in his opinion] in India the only method of control of rabies in dogs would be through an efficient system of preventive vaccination. Any method of vaccination based on Pasteur's original method or its modifications would, however, be impracticable. Therefore N. suggests that a single-injection prophylactic vaccine and at the same time a curative vaccine of high value [no suggestion concerning method of production] should be tried.

For prophylaxis the glycerinated phenolized vaccine of Umeno and Doi, and the phenol-glycerinated vaccine modified by Kondo are under investigation. The Nigerian modification of Semple's vaccine, and the Italian modification (Finzi) of the Japanese vaccine are being used for curative purposes.

The results achieved so far are said to be encouraging, and the work is being continued.—D. D. OGILVIE.

I. M'Corry, P. A. (1938). **Suspected Aujeszky's Disease (" Pseudorabies "— " Mad Itch "). [Correspondence].**—*Vet. Rec.* **50.** 454-455.

II. Galloway, I. A. (1938). **Aujeszky's Disease. Common Synonyms: " Pseudo-Rabies ", " Infectious Bulbar Paralysis ", " Mad Itch ".**—*Ibid.* 745-762. [Numerous refs.]

I. The author refers to the suspected outbreaks of " mad itch " reported by Harvey and Reid [*V. B.* **8.** 640.], and by Hart; he mentions a similar outbreak which he saw in Ireland in 1914. In all these outbreaks the infected cattle had intense pruritus of the hind quarters (tail, rump, vulva, thighs, etc.), sweating, gnawing and licking of the itching parts, and finally exhaustion which caused death.

II. G. brings together and reviews the available information on Aujeszky's disease; his article should be read in the original. Aujeszky's disease and rabies have little in common except that both are produced by filtrable viruses and cause symptoms referable to lesions in the central and/or peripheral nervous system. The itch symptom does not occur after intracerebral inoculation, and in the case of infected pigs it is absent. The disease in pigs appears to be relatively mild, though highly contagious, and does not seem to be contagious among small laboratory animals. Horses, dogs, cats, cattle, sheep, pigs and rats have become infected under natural conditions. In dogs it is a rapidly fatal disease. Occasionally, human beings have accidentally acquired infection in a mild form. Cats and rabbits are very susceptible to small doses of virus. Among cattle and sheep the disease is reported to be fatal, but not contagious. The means of spread are not clear. Transmission by subcutaneous inoculation or by the bite of an infected animal does not readily take place. Negri or similar inclusion bodies are not found. Pigs and monkeys and, to a lesser extent, g. pigs, are more resistant than cattle, dogs and rabbits. The serum of recovered pigs can neutralize the virus. The existence of outbreaks has been proved experimentally in Hungary, Austria, France, Russia, Rumania, Denmark, Tunis, North and South America, Holland, Spain and Yugoslavia. Clinical evidence indicates the possible existence of the disease in the British Isles, Switzerland and Germany.—J. A. Griffiths.

I. Frauchiger, E. (1938). Der erste Fall einer Poliomyelitis acuta anterior, " Kinderlähmung ", beim Tier. **[The First Case of Infection with the Virus of Human Poliomyelitis in an Animal].**—*Schweiz. Arch. Tierheilk.* **80.** 70-76. 2 figs. [3 refs.] [Also appeared in *Schweiz. med. Wschr.* **68.** 128-129].

II. Frauchiger, E., & Hofmann, W. (1938). Erfolgreiche experimentelle Poliomyelitisimpfungen auf das Rind. **[Successful Transmission of the Virus of Human Poliomyelitis to Cattle].**—*Ibid.* 260-262. [1 ref.]

I. The report of a naturally occurring alleged case of poliomyelitis [*i.e.*, human infantile paralysis] in a young bovine. [This report should be read with considerable reserve, because of the extreme difficulty of confirming the diagnosis in such an instance. At the same time the report is important because of the bearing it has upon various unconfirmed records of milk-borne epidemics of infantile paralysis].

II. The authors claim to have transmitted poliomyelitis by injecting virus from human cases into two young bovines, by the nasal, peritoneal and spinal (lumbar puncture) routes. Paraplegia resulted, and biochemical tests and cytological examination of cerebrospinal fluid gave results resembling those found in human poliomyelitis.—E. J. Pullinger.

FAIRBROTHER, R. W., & MARTIN, A. E. (1938). **Serologic Studies in Epidemic Influenza with Particular Reference to the Persistence of Antibodies after Infection.**—*Lancet.* **234.** 718-720. 3 tables. [6 refs.]

The results of these authors bear out the view expressed by FRANCIS and his colleagues [*V. B.* **8.** 287.] that antibodies to influenza virus do not persist for long after infection. After an attack of influenza the antibody content of the serum was found to rise considerably, but this level was not maintained. In 10-12 months the antibody titres as determined by complement-fixation and mouse protection tests tended to fall to levels similar to those before infection.

There appeared to be a relationship between antibody levels and susceptibility to infection.—D. L. HUGHES.

AJELLO, P. (1936). Una nouva forma di localizzazioni extragenitali del sarcoma di Sticher (prove positive de trapianto). [**Venereal Lymphosarcoma of the Dog : Extragenital Localization**].—*Clin. vet., Milano.* **59.** 147 164. 6 text figs., 2 figs. on 1 plate, 1 table. [Numerous refs.]

A. discusses venereal infective tumours on the genital organs of dogs, and describes a case. He succeeded in infecting five dogs out of six by subcutaneous injections of unfiltered tumour tissue, but other experiments with tumour filtrates were negative.—S. F. J. HODGMAN.

I. LESBOUYRIES, G. (1938). Les leucoses des oiseaux. [**Avian Leucoses**].—*Rec. Méd. vét.* **114.** 257-269.

II. UHL, E. (1938). **Active Immunization of Chickens against Chicken Leukosis with Agent Adsorbed by Aluminium Hydroxide.**—*Acta path. microbiol. scand.* Suppl. No. 37. pp. 544-551. 2 tables. [13 refs.] [In English].

I. This article, which consists of a useful review of the literature on avian leucoses, is not such as can be adequately abstracted, and should be consulted in the original by all those interested in the subject.

The literature is marshalled under the following headings :– (a) The erythroid and myeloid leucaemias are very easily transmitted. (b) Lymphoid leucosis, which is usually aleucaemic, may be transmitted. (c) Neurolymphomatosis (fowl paralysis), usually aleucaemic, may also be transmitted. (d) Lymphomatous leucaemia (lymphomatosis) and neurolymphomatosis are two aspects of the same disease. (e) All the types of avian leucoses are the same disease. (f) Certain types of tumour, particularly the avian sarcomata, are transmissible. (g) The avian leucoses may be accompanied by tumours of the same cellular character. (h) These leucoses may also be accompanied by tumours of a different cellular character. (i) There are similarities between mammalian and avian leucoses.

The article has one serious defect in that there are no references apart from the names of the authors and the dates.

II. Using material from the spleens of fowls with leucosis, adsorbed by aluminium hydroxide, U. attempted to immunize ten hens and 15 chicks. One month after the last inoculation the surviving ten hens and 11 chicks were tested for immunity to leucosis by the inoculation of leucotic material. Four hens and three chicks survived repeated inoculations of such material, four hens and four chicks acquired some degree of immunity as evident from a prolonged survival time when compared with similarly inoculated controls, and two hens and four chicks had no immunity. The plasma of the immune birds possessed bodies that neutralized the leucotic agent *in vitro.*

[The number of experimental birds employed appears to have been inadequate, and it is difficult to draw any conclusions from the results].—D. L. HUGHES.

NAGAHATA, S., & IKEGAYA, S. (1938). **Anti-Vaccinal Serum and its Anti-Viral Body.**—*J. Jap. Soc. vet. Sci.* **17.** pp. 1-17 of pt. 1. 12 tables. [8 refs.] [In Japanese: abst. from English summary pp. 1-2 of pt. 2].

Rabbits injected intravenously with 1 c.c. of a 1 : 5 dilution of glycerinated calf-lymph per kg. body weight were completely protected by five intravenous injections of 5 c.c. per kg. body weight of hyperimmune anti-vaccinal serum, the first being given one hour later, and the remaining four on the four succeeding days.

The serum, prepared by hyperimmunizing calves with glycerinated calf-lymph, was subjected to fractionation of its proteins. The euglobulin fraction was raised in amount, and further tests demonstrated that it is to this fraction that the protecting power of the serum is most closely related.—D. D. OGILVIE.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

ONO, S. (1938). **Studies on Warble-Flies of Manchuria and Inner Mongolia.**—*Kitasato Arch.* **15.** 199-246. 8 plates, 16 tables, 3 graphs. [11 refs.] [In English].

Since 1925, O. has published a number of papers on the general problem of warble fly in Manchuria and Inner Mongolia. While reiterating some of the matter contained in these publications, the present study is directed chiefly to the problem of further elucidating the role of " hypodermatotoxin " in perforation of the skin by the parasitic larva and in migration through the body of the host.

" Hypodermatotoxin " is contained in the midgut of the first and second stage larva, but subsequently disappears and is replaced by cell debris. The action of the toxin was readily demonstrable by inoculation of test animals and it is considered that lysis by this substance is the actual mechanism of skin penetration.

Particular attention is directed to the action of the toxin on germinal cells. When a normal female rabbit was mated with a male rabbit treated with sublethal doses of toxin (5-13 doses of 2-20 c.c. of 0·025-0·2% toxin solution over 68-135 days), a large number of the offspring showed abnormality, especially of the gall-bladder. If, however, the females were injected with toxin and mated with normal males, the offspring were normal.

A detailed review of the morphology, bionomics, migration of larvae, and life-history of the warble flies of the region (*Hypoderma lineata* and *H. bovis*) is incorporated.—D. D. OGILVIE.

DINULESCO, G., & VASILESCO, C. (1937). Etude anatomo-pathologique des tumeurs duodénales chez le cheval produites par les larves de Gastrophilus meridionalis (Pillers et Ewans [Evans]). [**Duodenal Tumours Caused by Horse-Bot Larvae** (*G.m.*)].—*Arhiva vet.* **29.** No. 6. 1-11. 10 figs. [3 refs.] [In French].

The authors describe the gross pathology of intestinal infestation of horses by *G.m.*, and the histological structure of the tumours which are formed in the duodenal wall due to the presence of larvae. The horses had come from Spain and were examined at an abattoir in Paris; the first instar larva is found inthe buccal and pharyngeal mucosa, the later instars in the intestine.

The second stage larva penetrates the mucosa of the duodenum to the serous ccat, where its presence causes an inflammatory reaction; granulation tissue results, and finally a fibrous tumour forms around the larva. After moulting to the third

instar, the larva emerges from this " cell " into the lumen of the duodenum, and attaches itself by the anterior segments to the wall of the intestine.—J. MacLeod.

Thomsen, M. (1938). Stuefluen (*Musca domestica*) og Stikfluen (*Stomoxys calcitrans*). Undersøgelser over Biologi og Bekaempelse samt en Oversigt over andre til Husdyr eller Boliger knyttede Fluearter. [**Biology and Control of *M.d.* and *St.c.*, with a Survey of Species of Flies Associated with Domestic Animals and Houses**].—*Beretn. Forsøgslab., Kbh.* No. 176. pp. 352. 107 text figs., 30 figs. on 13 plates, 30 tables. [Numerous refs.]

This book is intended as a source of information for everyone interested in rural and general hygiene. Research work on the biology of the two most important species of flies has finally led to a system of effective control. Under circumstances typical of rural conditions in Denmark it is found that *M.d.* lays most readily in swine dung, less readily in horse and calf dung, and hardly ever in cow dung, especially when not much straw is mixed in it. A thorough daily cleaning out of the stables is necessary to prevent propagation of the fly. The swine dung is placed on the dunghill first, and then covered with horse and calf dung, and finally with cow dung. If the daily dung heaps are placed in proper tanks and the above covering system is persevered with during the summer, very few house-flies develop. On farms where the cows are at pasture and no cow dung is available for a top covering, the swine dung should be covered with sheets, which can be made by sewing sacks together, *e.g.*, sacks used for saltpetre, etc. Any modification of the covering method can be used as long as it prevents egg laying and the development of larvae.

The problem of controlling *St.c.* is simpler. In Danish farms most of these flies are bred in the calf boxes, consequently the first essential is a frequent cleaning out (at least once a week) of the boxes and of the stable in general ; this should be done throughout the year. In sheltered stables the development and egg laying continue into the winter, and unclean and moist corners often become breeding places. During the summer it is necessary to cover the dung from calf boxes in the manner already described.

The book contains excellent illustrations showing the different covering systems. There is, however, much to do in the way of education and organization before the anti-fly campaign will receive the full co-operation of the common people in the rural districts.—H. C. Bendixen (Copenhagen).

Fenton, F. A., & Bieberdorf, G. A. (1936). **Fly Control on A & M Farms, Stillwater, Okla.**—*J. econ. Ent.* **29.** 1003-1008. 2 figs. [2 refs.]

An account of measures taken to deal with the fly problem created by the high concentration of cattle, poultry, and animal sheds near an agricultural college at Stillwater, Oklahoma. The measures included disposal of manure or its treatment with borax powder, spraying of the barns with pyrethrum, trapping of flies and the use of poison baits. [Little significance can be attached to the recorded results since all measures were operative simultaneously and no steps were taken to determine the extent of seasonal fluctuation in fly numbers or the possibility of variation due to causes unrelated to the measures adopted. The species of flies concerned are not stated, but the flies caught in the traps were mainly *Musca domestica*].—J. MacLeod.

I. Barrett W. L., Jr. (1937). **Natural Dispersion of** *Cochliomyia americana*. —*J. econ. Ent.* **30.** 873-876. 1 table. [4 refs.]

II. BORGSTROM, Floreine A. (1938). **Studies on Experimental Cochliomyia americana Infestations with Special Reference to the Bacterial Flora and the Development of Immunity.**—*Amer. J. trop. Med.* **18.** 395-411. [10 refs.]

I. Although the permanent establishment of the screw-worm fly *Cochliomyia hominivorax* Coq [*C. americana* C. & P.], as a species is restricted within recognized northern limits by winter temperatures, cases of infestation occur in summer north of this survival area. Much of this seasonal spread is due to the movement of livestock, but natural unaided dispersion may apparently also be responsible in certain areas. B. found that between March and August, 1936, the species spread over 500 miles northward from Uvalde, Texas, at an average rate of about 35 miles per week, and north east for over 300 miles. The marginal areas from which this seasonal dispersion occurred had a relatively low density of fly population.

II. The fact that experimental infestation by ten or more larvae of *C.a.* invariably caused death of g. pigs suggested that the lethal effect must be due less to destruction of tissue than to bacterial or enzyme activity or to metabolic by-products of the larvae. An endeavour was therefore made to determine whether recovery resulted in the development of immunity.

Bacteriological examination of natural and experimental infestation wounds showed that a species of *Proteus* was a constant, and, after 24-48 hours of infestation, the sole bacterial inhabitant of the lesion. The characters of the species are given, and the name *Pr. chandleri* suggested. General and local immunization of g. pigs against this species, by intraperitoneal and subcutaneous injection of successive increasing doses of culture, failed to produce immunity against the effect of subsequent infestation.

G. pigs experimentally infested with sublethal numbers of larvae were found on recovery to survive reinfestation by numbers of larvae which were sufficient to kill control animals. This immunity was similarly conferred by treatment of experimental lesions with the exudate of larval infestations. Further, a mortality of up to 50% of the larvae occurred at the early stages of reinfestation. The immunity appeared to be confined to the area of the primary lesion, and to disappear after 20-40 days. [The precise value of the results is slightly obscured by discrepancies in successive references to the same experiments].—J. MACLEOD.

PARASITES IN RELATION TO DISEASE [HELMINTHS]

ORTLEPP, R. J. (1937). **South African Helminths.—Part I.**—*Onderstepoort J. vet. Sci.* **9.** 311-336. 21 figs. [Numerous refs.]

Seven new species of helminths are described, *viz* :– *Echinococcus felidis* from a lion, *Anoplocephala* (S.L.) *genettae* from a genet, *Gyrocoela kiewietti* from a plover, *Dubioxyuris macroscelidis* from an elephant shrew, *Subulura dentigera* from a guinea-fowl, *Heteroxynema vlakhaasi* from a hare, and *Hyracofilaria hyracis* from a hyrax. In addition, a new family of the Oxyuroidea, *viz*, Dubioxyuridae, is created for the reception of the parasite from the shrew. The status of the three species *Subulura suctoria* (Molin), *S. differens* (Sonsino) and *S. brumpti* (Nopez-Neyra) is discussed, and evidence is brought forward to show that these three species are co-specific.

VAN DER WESTHUYSEN, O. P. (1938). **A Monograph of the Helminth Parasites of the Elephant.**—*Onderstepoort J. vet. Sci.* **10.** 49-190.

A synopsis of all the hitherto known helminth parasites of the Indian and African elephant is presented. The author examined a large proportion of the

genera and found it necessary to augment the description of certain structures and also to amend the diagnosis of a few of the genera.

The trematodes considered consist of eight species belonging to five genera, and the cestodes are represented by only one species, all hitherto known parasites.

The nematode collection contained specimens of practically all the species so far described, with the addition of two new species belonging to the genera *Choniangium* and *Grammocephalus* respectively. The family Strongylidae is represented by six genera with 35 species, the family Ancylostomidae by three genera including seven species, and the family Syngamidae by one genus with one species. Of these ten genera, four are found in the Indian elephant only. The nematodes were further found to exhibit a fairly strict host specificity in that no one species was found which is common to both the Indian and African elephant. However, a species of the genus *Grammocephalus* was found which combines more or less the features presented by the two previously described species, one of which parasitizes the Indian, and the other the African, elephant.

From a study of larvae found amongst the collection, remarks on possible life-histories of the genera *Grammocephalus* and *Murshidia* are presented.—J. R. M.

EISENBRANDT, L. L. (1938). **On the Serological Relationship of some Helminths.** —*Amer. J. Hyg.* **27.** 117-141. 7 tables. [Numerous refs.]

Following the establishment of serological relationships in the vertebrates, E. considers that chemical phylogeny could, with profit, be extended to the invertebrates.

Extracts of the helminth parasites were made in saline solution in as fresh a state as possible. The concentration of nitrogen in each extract was determined in order to safeguard against the use of unequal amounts of antigen. Antisera were then made in rabbits, an amount containing a total dose of 0·0096 g. total nitrogen being injected into an animal of 2,500 g. body weight. This small amount of antigen was found to have as great a stimulating effect as much larger doses. The reactions were tested in each instance by the precipitin test. A wide variety of species extending through two phyla were tested, and the results tabulated. In interpreting serological similarity, the titres of the precipitin tests were expressed as percentage values of the homologous titres which were regarded as 100%. Reciprocal tests did not generally give exact agreement, and unfortunately prevent the data of this work from being of primary importance. The complexity of the antigen structure causes further complication. The reliability of the tests is demonstrated, however, by the constant results observable in several species.

While a study of the results reveals numerous minor deviations, it appears that, in general, the serological relationship of helminths agrees with the present taxonomic classification. E. urges the necessity for serological work on smaller groups of parasites where it seems that useful and detailed results might be achieved.—D. D. OGILVIE.

WU, K. (1937). **Susceptibility of Various Mammals to Experimental Infection with *Fasciolopsis buskii* (Trematoda : Fasciolidae.)**—*Ann. trop. Med. Parasit.* **31.** 361-372. 16 figs. on 2 plates, 1 table. [17 refs.]

Encysted metacercariae of *F.b.* were fed to six pigs, four dogs, four cats, one sheep, one goat, one ox, and a number of other mammals.

In the pigs practically all those recovered were mature, and located in the duodenum. They appeared to be of low pathogenicity.

Flukes were found in only one of the dogs. They were immature and were situated in the duodenum.

The remaining animals appeared to be resistant to *Fasciolopsis*, and showed no signs of infection.—D. D. OGILVIE.

CAWSTON, F. G. (1938). **The Cause and Treatment of Bilharzia Disease.**—*S. Afr. med. J.* **12.** 51-52.

C. mentions the occurrence of fork-tailed cercariae in several species of water snails in South Africa. The question of methods of giving tartar emetic other than intravenously is discussed. Rectal infusion did not seem to be of much value, but when the drug was rubbed as an ointment into the skin of the abdomen of human patients the results were promising.—E. M. ROBINSON.

KAU, L. S., & WU, K. (1938). **A Note on the Pathology of Schistosomiasis Due to *S. japonicum* among Cattle in China.**—*Ann. trop. Med. Parasit.* **32.** 129-132. 2 figs. on 1 plate. [1 ref.] [See also *V. B.* **8.** 776].

A further study of the livers and spleens of cattle and water buffaloes with schistosomiasis is reported.

Marked atrophy, with fibrosis and adhesions, occurred in both organs. The fibrosis often extended to the bile ducts and gall-bladder. Some of the livers contained small yellowish nodules, of which some were calcified and others filled with greenish pus. No parasites were found in these nodules. In oxen the organs were more often of normal size than in the water buffaloes, and adhesions were uncommon.

Histologically, atrophic cirrhosis from chronic passive congestion, round cell infiltration with " pseudo-tubercle " formation, and ova with eosinophiles, round cell and endothelial cells in attendance were demonstrable, and also areas of necrosis.
—D. D. OGILVIE.

I. CANARD. (1937). Contribution à l'étude de l'habronémose gastrique et de ses complications. [**Gastric Habronemiasis in Horses**].—*Rev. vét. milit.* **21.** 251-259.

II. FAURE, L. (1938). Nouveau traitement des plaies d'été (habronémose cutanée). [**New Treatment for Summer Sores (Habronemiasis)**].—*Cah. Méd. vét.* **8.** 35.

I. During numerous autopsies carried out on horses and mules in Madagascar and South Africa, it was noted that gastric habronemiasis was often complicated by secondary infection of the spleen. Lesions, symptoms and treatment are described. Some evidence is produced to indicate that *Hippobosca* may be a vector.

II. Three cases are described in which the local application of " kélève ", a refrigerant, brought about a cure. It was necessary first to scarify the affected part. F. suggests that the curative action of " kélève " is both physical and chemical.—F. H. MANLEY.

ORTLEPP, R. J. (1937). **Some Undescribed Species of the Nematode Genus Physaloptera Rud., together with a key to the Sufficiently Known Forms.**—*Onderstepoort J. vet. Sci.* **9.** 71-84. 8 figs. [Numerous refs.]

O. described three new species, namely *Ph. immerpani* from hedgehogs, *Ph. losseni* from a hawk, and *Ph. tasmani* from a chameleon. In addition he gives a key for the identification of the 71 sufficiently known species.

RAO, M. A. N. (1938). *Poteriostomum ratzi* (**Kotlan, 1919**).—*Indian J. vet. Sci.* **8.** 131-132. 2 figs. [1 ref.]

The presence of *P.r.* in horses in India is recorded for the first time. Three

males and one female of this species were found in the large intestine of two ponies in Madras. The general characters of the male worm are described.—D. D. O.

IMMUNITY

GORET, P. (1938). Quelques aperçus sur la chimie de l'immunité. Conception actuelles sur la nature des antigènes. **[The Chemistry of Immunity. Modern Conception of the Nature of Antigens]**.—*Rec. Méd. vét.* **114.** 577-609. [15 refs.]

A simply written review article of the researches which have led up to the modern chemical concepts of immunity. In an introductory section G. discusses the *in vitro* antibody studies upon which all the early theories of immunity were based. The term antigen is defined and is classified as follows :–

Antigen—
- True (complete) –> A stimulator and binder of antibody.
- Partial (haptene)
  - A binder of antibody without visible effect *in vitro*, and thus sometimes classed as an inhibitor of agglutination, etc.
  - A non-stimulator.

Antigens may be divided into a number of classes :– 1. *Natural proteins.* 2. *Chemical antigens* :– (a) simple diazo groupings ; (b) complex substances such as lipoids, hormones, enzymes, etc. 3. *Bacterial bodies and fractions thereof.* 4. *Toxins.* 5. *Filtrable viruses.* 6. *Natural fluid antigens* :– (a) specific, *e.g.* blood serum, etc. ; (b) non-specific, *e.g.* Forssmann antigen.

Certain of these classes of antigen are then discussed in detail, chief attention being paid to the natural proteins and bacterial antigens.

Natural Proteins.—The work of OBERMAYER and PICK and of LANDSTEINER and his school is outlined, mention being made of the importance of the diazo grouping and certain other binding groups for determining the ability to stimulate antibody production, whilst the haptene portion determines specificity. Factors playing a part in specificity include the actual chemical ring structure, amine and other functioning groupings, aliphatic chains and isomerism.

Bacterial Antigens.—This section consists of a review of what is known about the chemistry of bacterial antigens, with special reference to the fractionation of the pneumococcus and salmonella groups. This section of necessity includes considerable mention of the studies of BOIVIN and MESROBEANU on the " antigène complet " [*V. B.* **7.** 187.] which is explained as follows :–

" Antigène complet " (*i.e.*, polysaccharide + fatty acid), an opalescent non-dialysable solution which is specific, antigenic and toxic.

Split by chemical or enzymic action

(a)	(b)
A precipitate of free fatty acid which is non-specific, non-antigenic and non-toxic.	Residual antigen (pure polysaccharide) which is a solution that is dialysable, specific, non-antigenic and non-toxic.

—E. J. PULLINGER.

KOTLJAROVA, H. (1937). Serodiagnostika brucelleza u ovec pri estestvennom i eksperimentaljnom zaraženii. [**Serological Tests for the Diagnosis of Brucellosis in Sheep; Natural and Experimental Infection**].—*Brucellosis in Sheep.* pp. 177-203. Numerous tables, 6 graphs. [18 refs.] Moscow: Viem. Publ. Dept.

Studies began in 1933 on the relative diagnostic value of the agglutination test and of the complement-fixation test in brucellosis on a total of 10,724 sheep on the Commission's Experimental Farm in North Caucasus. Aggl. tests were made with formalin-killed cultures of standard virulent strains of *Br. melitensis* and *Br. suis* in serum dilutions of 1 : 10, 1 : 20, 1 : 40, 1 : 80, and higher. Customary experience was confirmed, that it is necessary to carry out repeated tests on flocks before the infection is eliminated.

In a further series of tests, 24·1% of the sheep which reacted positively in the morning gave a negative reaction in the evening of the same day. In a series in which sheep were tested either daily or at intervals of five days for a period of up to two months, considerable variations in the titres, and frequent falling off in the titre, were observed. It is considered that reactions at 1 : 10 and 1 : 20 dilutions should be looked upon as positive. Similar results were obtained with the c.-f. test.

IRWIN, M. R., & FERGUSON, L. C. (1938). **Increase of Bactericidins in the Serum of Cattle following Recovery from Infection with** *Brucella abortus.*—*Proc. Soc. exp. Biol., N.Y.* **38.** 451-452. [3 refs.]

It was previously found [*V. B.* **6.** 699.] that bovine serum had a greater bactericidal action against *Br.a.* than comparable whole blood.

The authors have now tested for its bactericidal properties serum from normal cows and from cows which had been infected, and from whose blood practically all the agglutinins had disappeared, these animals being regarded as " recovered ". Control tests were carried out with heated serum, with the complement used, and with a combination of the heated serum and complement.

The tests demonstrated " immune " bactericidins in sera 18-20 months after infection and in the absence of an appreciable agglutinin titre, the bactericidal action being about 25 times greater than with normal sera.—C. V. WATKINS.

MUNGER, Myrtle, & HUDDLESON, I. F. (1938). **The Detection of Antigenic Variants of Brucella by means of an Opsonocytophagic Test.**—*J. Bact.* **35.** 255-260. 1 table. [7 refs.]

Fifty-two known antigenic variants and nine normal strains of brucella were compared by the thermo-agglutination test, Aichelburg's fuchsin test [see p. 230.] and the opsonocytophagic test [for latter see *V. B.* **8.** 566 & 648.], and the tests were repeated several times at wide intervals. It had previously been found that the two first mentioned tests had not been consistently reliable when the same strain had been tested on several occasions. The bacterial cells of the antigenic variants were phagocytosed in large numbers, while the normal cultures were phagocytosed only slightly if at all. Only 31 of the variants were positive to the other two tests when tested on one or more occasions, and the opsonocytophagic test is considered to be the most satisfactory.—S. J. GILBERT.

BOIVIN, A., & MESROBEANU, L. (1938). Recherches sur les antigènes somatiques et sur les endotoxines des bactéries. IV. Sur l'action anti-endotoxique de l'anticorps O. V. Sur le pouvoir vaccinant de l'antigène O et sur l'action anti-infectieuse de l'anticorps O. [**Research on Somatic Antigens and Endotoxins. IV. The Anti-Endotoxic Action of " O " Antibodies. V.**

The Vaccinating Power of " O " Antigens and the Anti-Infectious Action of " O " Antibodies].—*Rev. Immunol.* **4.** 40-52 and 197-210. 13 tables. [Numerous refs.] [See also *V. B.* **8.** 755].

IV. Precipitation tests were performed with a *Salmonella typhi-murium* antiserum and the " O " endotoxins and polysaccharide haptenes of the homologous *Salmonella*, of *S. paratyphi* B, and of *S. enteritidis*. The agglutinating titre for these bacteria was also estimated. Thirty-six mice were injected subcutaneously with 1 c.c. of this serum, and on the next day, together with 36 controls, they received graded doses of the glyco-lipid endotoxins of the three *Salmonella* species. The anti-endotoxic action of this "O" antiserum corresponded with its serological specificity for the endotoxins injected. Similar results were obtained with the antisera and endotoxins of three serologically distinct strains of *Pseudomonas pyocyanea* and with the antisera and endotoxins of *Shigella dysenteriae* [*Bacterium shigae*] and *Sh. paradysenteriae* [*Bact. flexneri*].

V. A rough variant of *S.t.-m.* was shown to be much less virulent for mice than a smooth variant. Thirty-six mice received eight intraperitoneal injections of the glyco-lipid antigen of *S.t.-m.* in doses of 0·001-0·2 mg. at weekly intervals. The serum of these mice precipitated very high dilutions (10^{-7}) of the homologous glyco-lipids. Thirty immunized mice and 30 controls were injected (intraperit.) with 0·5 c.c. of dilutions of *S.t.-m.* broth cultures. Nineteen test mice survived, and 13 smooth strains of *S.t.-m.* isolated from them proved as virulent as the original strain. Three tables show that the protective power of glyco-lipid vaccines of *S.t.-m.*, *S.p.* B, *S.e.* and *Bact. shigae* against *S.t.-m.* infection corresponded with their antigenic relationship. Injection of 1 c.c. of a high-titre glyco-lipid antiserum into mice rendered them slightly more resistant to *S.t.-m.* infection than were control mice.—R. O. Muir.

Walsh, T. E., & Cannon, P. R. (1938). **Immunization of the Respiratory Tract. A Comparative Study of the Antibody Content of the Respiratory and Other Tissues Following Active, Passive and Regional Immunization.**—*J. Immunol.* **35.** 31-46. 4 tables. [7 refs.]

Following general active or passive immunization of 15 rabbits against *Salmonella typhi* or *S. paratyphi B*, the ratio of tissue-antibodies (of the respiratory tract) to serum-antibodies was found to average 1 : 10. Intranasal vaccination of 33 rabbits with or without previous irritation with formalin solution showed that the ratio of tissue-antibodies to serum-antibodies in tissues regionally vaccinated averaged 1 : 5, although instances occurred of ratios as high as 1 : 1 and 2 : 1. In 21 rabbits vaccinated with two antigens, one given regionally (intranasally) and the other generally (intra-abdominally), the ratio of tissue-antibodies to serum-antibodies in tissues regionally vaccinated was always higher for the regional than for the general antigen. The authors attributed the last results to the local formation of antibody in the tissues regionally stimulated by antigen, and stressed its importance in thus closing a portal of infection.—R. O. Muir.

Jonnard, R. (1938). Principe de la titration des antigènes et des anticorps par réfractométrie interférentielle. [**The Titration of Antigens and Antibodies by Refractometry**].—*C. R. Soc. Biol. Paris.* **127.** 418-422. [19 refs.]

The addition of increasing amounts of type-specific polysaccharide to a type III anti-pneumococcal rabbit serum demonstrated that the refractive minimum was obtained with a concentration corresponding with neutralization by ordinary methods, that the maximum turbidity appeared for a concentration slightly higher than that corresponding with the refractive minimum, and that certain serum

constituents had an affinity for both specific and non-specific sugars. Analogous experiments with tetanus toxin and antitoxin showed that, apart from certain zone phenomena, refractive minima for different toxins were given by concentrations of toxin practically identical with those which were neutralized by the given amount of sérum in *in vivo* experiments.—R. O. MUIR.

BEAUVILLAIN. (1938). Note clinique sur l'emploi du sérum antigangréneux polyvalent de l'Institut Pasteur dans le traitement d'une lymphangite suppurée. [**Use of Polyvalent Anti-Gas Gangrene Serum of the Pasteur Institute in the Treatment of Suppurative Lymphangitis in Horses**].—*Bull. Acad. vét. Fr.* **11.** 135-138.

B. describes a case of suppurative lymphangitis due to staphylococci, in an army mare, giving details of clinical signs and treatment. Four subcutaneous injections of 20 c.c. of polyvalent anti-gas gangrene serum from the Pasteur Institute, at two-day intervals, resulted in complete recovery within 18 days. This account is followed by a discussion of the presence in normal and therapeutic sera of natural non-specific antitoxins.—R. O. MUIR.

RAY, N. N., & DAS, G. C. (1938). **The Immunization of Horses for the Production of High-Titre Tetanus Antitoxin. Part II.**—*Indian J. med. Res.* **26.** 317-320. 2 tables. [2 refs.] [See also *V. B.* **8.** 760].

Eighteen horses had been immunized with tetanus toxoid and bled regularly until their titre fell and could not be raised by repeated heavy doses of toxoid. After 4-5 weeks, 12 of them received five increasing doses of toxoid and powdered tapioca and then five heavy doses (500-550 c.c.) of toxoid and 1 % calcium gluconate. The average final titre was 1,625 international units, but fell rapidly after several bleedings. The average titre of six horses injected with toxoid was 617 I.U. —R. O. MUIR.

RAMON, G., BOIVIN, A., RICHOU, R., DJOURICHITCH, M., & MACCOLINI, R. (1938). La séro-anatoxithérapie des toxi-infections en évolution. Ses bases expérimentales. [**The Sero-Anatoxic Therapy of Toxic Infections in the Early Stages**].—*Rev. Immunol.* **4.** 24-39. 6 tables. [9 refs.]

The subcutaneous injection of three groups of four rabbits each with tetanus anatoxin and antiserum, followed by two doses of anatoxin at longer intervals for each group, resulted in the same final titre.

Thirty-seven rabbits, in seven groups, received an injection of tetanus anatoxin or of anatoxin-antiserum mixtures in varying proportions, followed by two doses of anatoxin. There was no immunity after the first dose in animals injected with an anatoxin-antiserum mixture. The injections of anatoxin produced a strong immunity in all animals.

Ten groups of five rabbits each were injected twice, at an interval of 18 days, with tetanus anatoxin or with one of various anatoxin-antitoxin complexes. An injection of 10 c.c. of an anatoxin-antitoxin mixture at flocculation point, or 1 c.c. of a condensed anatoxin precipitate, produced the same degree of immunity as did 5 c.c. of anatoxin. The other complexes produced little or no immunity. —R. O. MUIR.

BISSET, K. A. (1938). **The Structure of " Rough " and " Smooth " Colonies.** —*J. Path. Bact.* **47.** 223-229. 11 figs. on 3 plates. [15 refs.]

B. stresses the fact that colonial structure is merely a product of the nature of the individual organisms composing the colony. Thus, because rough organisms

tend to lie close together and in threads, they build a colony with the typical " medusa-head " appearance. Smooth organisms, on the other hand, tend to lie separate from one another, and the resulting colony takes on a different appearance. This difference includes a mucoid consistency presumably due to the nature of the surface of the organisms. Between these two extremes are found colonies composed of mixtures of R and S individuals or, alternatively, they may be composed of individuals in the transitional S —> R stage.—E. J. PULLINGER.

DOLD, H. (1937). Neue Beobachtungen über antibakterielle Hemmungsstoffe (Inhibine) und antibakterielle Wandlungstoffe (Mutine). [**Investigations on the Bacteria-Inhibiting Substance, " Inhibine ", and the Transforming Substance, " Mutine "**].—*Zlb. Bakt. I.* (*Orig.*). **140.** 265-268. [See also *V. B.* **8.** 275].

Working with human saliva, D. claims to have shown the presence of an agent which hinders the development of *Corynebacterium diphtheriae*, and which he calls " inhibine ". On account of differences in the respective physical characters of the two substances, he considers that " inhibine " is not the same as lysozyme. In addition, he claims to have demonstrated the presence of a substance which tends to cause typical forms of *Corynebact. diphtheriae* to change into atypical forms ; this he calls " mutine ".—E. J. PULLINGER.

STRAZBERGER, S. (1937). Badania nad zjawiskiem F, Duran-Reynalsa w zwiazku z działaniem antivirusu. [**Duran-Reynals Phenomenon and the Action of Antivirus**].—*Wiad. weteryn.* **16.** 421-430. 7 tables. [5 refs.] [French summary].

Streptococcal or staphylococcal antivirus injected 24 hours before testicular extract caused inflammation and opposed the diffusing action of the latter, but when the two were injected simultaneously, these effects were not produced. Irritant substances such as saponin and turpentine acted in the same way. A 24-hour culture of staphylococci had more or less the same action as the antivirus.

DISEASES, GENERAL.

SAL, G. (1934). Kórszövettani elváltozások a sertéspestisben és a paratyphysban beteg sertések középponti idegrendszerében és nyirokcsomóiban. [**Histopathological Changes in the Central Nervous System and Lymph Nodes in Pigs with Swine Fever and Paratyphoid**].—*Közl. Oesszehas. élét- es kórtan Köréből.* **26.** 95-132. 25 figs. on 4 plates, 2 tables. [Numerous refs.]

[This article was also published in German—*V. B.* **5.** 556. The author has changed his name to SALYI, and the German article was published under the latter name].

CORNACCHIA, G. (1938). Osservazioni e considerazioni su alcune malattie infettive del bestiame in A.O.I. [**Some Infectious Diseases of Animals in Italian East Africa**].—*Clin. vet., Milano.* **61.** 390-393.

African horse-sickness was very prevalent both in horses on the plains and at altitudes of over 2,000 m., mules being found affected in the mountains. C. claims good curative results with intravenous injections of HgI_2 in 45 mules treated.

Rinderpest was wide-spread, but it is said that no facilities for immunization were available where C. was working. It was observed in camels, which were relatively resistant to infection.

In the few cases of camel trypanosomiasis treated, neither naganol, quinine, nor arsenobenzol gave good results.

BELLER, K. [Prof. Dr., Reg.-Rat als Mitglied des Reichsgesundheitsamtes], & ZUNCKER, M. [Dr., Wiss. Angestellter des Reichsgesundheitsamtes]. (1936). Sammelbericht über die mit Mitteln des Reichs- und Preussischen Ministeriums für Ernährung und Landwirtschaft durch-geführte Forschungsarbeit auf dem Gebiete der Geflügelkrankheiten. [**Report on Research on Poultry Diseases Carried out with the Aid of the Reich and Prussian Ministry of Nutrition and Agriculture**]. pp. 112. 12 tables, 8 graphs, 1 map. Berlin: Fritz Pfenningstorff. [8vo]. [RM. 1.50].

This book is a comprehensive account of research work on poultry diseases carried out in Germany. It cannot be systematically abstracted. It covers tuberculosis, coryza, fowl cholera, pullorum disease, coccidiosis, fowl plague, pox, laryngotracheitis, leucosis, fowl paralysis, parasitic and nutritional diseases.

—SASSENHOFF (MUNICH).

FOURIE, P. J., & RIMINGTON, C. (1937). **Living Animal Cases of Congenital Porphyrinuria.**—*Nature, Lond.* **140.** 68. 1 fig.

The authors refer to what they believe to be the first living cases of porphyrinuria in animals yet described. The full account has been published elsewhere [see below].—J. E.

FOURIE, P. J. J. (1936). **The Occurrence of Congenital Porphyrinuria (Pink Tooth) in Cattle in South Africa (Swaziland).**—*Onderstepoort J. vet. Sci.* **7.** 535-566. 10 figs., 5 tables, 1 graph. [Numerous refs.]

F. describes the occurrence of congenital porphyrinuria in 13 bovines, all of which were the progeny of one bull. Twelve of these cases occurred in a single herd and the thirteenth in a neighbouring herd. F. examined personally six of the 13 cases.

These are the first known living animal cases of the anomaly. A clinical description of four cases is given and a pathological description of two cases. General symptoms were :–

(1) General—animals did not thrive, and remained in poor bodily condition, when kept under ordinary conditions.

(2) Urine—varied in colour from amber in the mild cases to red or reddish brown in the more severe cases. Uro- and coproporphyrin were present in the urine.

(3) Teeth and bones—all were of a reddish brown colour; permanent as well as temporary teeth were affected, and the dentine and cement substance were markedly pigmented, but not the enamel; tendons, ligaments and cartilage were not pigmented.

(4) Photosensitization—sores formed on parts of the body not protected by hair; these healed when the animals were protected against the sun by stabling.

(5) Haematology—there was a slight suggestion of immaturity of the same elements of the blood of different affected animals continuously exposed to the sun, but in these cases there was no well established anaemia for which the porphyrinuria could be blamed.

Cells of the reticulo-endothelial system contained pigment granules, which in general would seem to correspond with the pigment described by BORST and KÖNIGSDÖRFFER [(1929). Untersuchungen über Porphyria. Leipzig: S. Herzel.]

Of the affected animals, 77% were males and 23% females. In this respect

the incidence of the condition resembled the analogous condition in man, as well as the incidence of recorded cases of alcaptonuria and albinism, thought to be hereditarily transmitted as recessive characters. There is very strong evidence that the condition in these animal cases was hereditarily transmitted as a recessive character.

" Pink tooth " is suggested as the popular name for the animal cases. This emphasizes the clinical feature of the anomaly by means of which it can be easily differentiated from redwater (piroplasmosis).

RIMINGTON, C. (1936). **Some Cases of Congenital Porphyrinuria in Cattle: Chemical Studies upon the Living Animals and Post-Mortem Material.**—*Onderstepoort J. vet. Sci.* **7.** 567-609. 23 figs., 2 charts, 1 appendix. [Numerous refs.]

Of several living bovine cases of congenital porphyrinuria, discovered on a farm in Swaziland, and all the progeny of a single pure-bred shorthorn bull [see above], one animal was slaughtered for experimental purposes. This case, a castrated male, two years four months old, had definite clinical symptoms of photosensitization and passed port wine-red coloured urine, exhibiting porphyrin absorption bands. The bones were found to be coloured a mahogany brown, and on transverse section concentric rings of lighter and deeper pigmentation were seen. The cartilages were normal.

Employing, in most cases, Fischer's methods, R. examined the individual organs and tissues for porphyrins, and pure crystalline materials (methyl esters) were obtained as follows :– in the urine—uroporphyrin (275°-7°C.), and coproporphyrin I (233°-5°C.); in the faeces, coproporphyrin I (243°-4°C.) and its copper complex; in the blood plasma, coproporphyrin I (243°-4°C.); bones, uroporphyrin (267°-7°C.), and from a small sample derived from another case uroporphyrin (273°-4°C.): these esters had copper complexes 311°-4°C. and 310°-3°C. respectively. From the mother liquors of the main crystallization was isolated a uroporphyrin with ester M.P. 253°-5°C., but yielding a normal copper salt; from bone-marrow, uroporphyrin (278°C.) and coproporphyrin I (244°-5°C.); from the spleen, uroporphyrin (278°C.); from the liver, uroporphyrin together with its copper complex (313°C.); and from the bile, coproporphyrin I (237°C.). In other instances the yields of pure pigment were too small for identification by other than spectroscopic measurements.

The significance of these pigments belonging to the I series of porphyrins, is discussed in relation to normal haemoglobin synthesis and catabolism and the disarrangements of pigment metabolism occurring in disease and in certain states of intoxication such as lead or sulphonal poisoning, etc. A suggestion is made as to the nature of the anomaly in congenital porphyrinuria, and a provisional scheme of pigment metabolism is mapped out.

Examination of samples of urine from human cases of bilharziasis (schistosomiasis) showed that in this disease the excretion of porphyrins is not appreciably raised above the normal.

Experiments upon the chromatographic purification of uroporphyrin esters are reported, and it is shown that the bone and urine uroporphyrins from these bovine cases (M.P. approximately 278°C.) can be separated chromatographically into uroporphyrin I with M.P. 293°C. and a uroporphyrin melting at 260°C., presumably uroporphyrin III.

The M.P. of bile coproporphyrin was raised by similar treatment from 237°C. to 246° or 248°C., and a small fraction having a coproporphyrin spectrum was separated during the chromatographic treatment.

Dioxan was found to be an excellent solvent for the recrystallization of the porphyrin esters.

I. Terrell, E. E., Robertson, O. H., & Coggeshall, L. T. (1933). **Experimental Pneumococcus Lobar Pneumonia in the Dog. I. Method of Production and Course of the Disease.**—*J. clin. Invest.* **12.** 393-432. 26 figs., 1 table, 10 charts. [12 refs.]

II. Robertson, O. H., Coggeshall, L. T., & Terrell, E. E. (1933). **Experimental Pneumococcus Lobar Pneumonia in the Dog. II. Pathology. III. Pathogenesis.**—*Ibid.* 433-493. 32 figs., 3 tables. [Numerous refs.]

I. Pneumococci suspended in a viscous starch broth mixture were implanted into the terminal portion of the bronchial tree of selected healthy dogs by means of injection through a radiopaque catheter under the fluoroscope. The strains of pneumococci chiefly used were a virulent type I strain (A5) and a type II strain (Vo) of considerably less virulence. The total volume injected was 1 c.c. (a further 1·2 c.c. being allowed for the content of the catheter itself). A hard rubber ureteral catheter (size 11) was used, the tip being covered with soft tubing. It was passed as far as possible and then withdrawn 0·5 cm. The right lower lobe was usually chosen for production of the initial lesion. A preliminary injection of morphine sulphate was given, sufficient to quieten the animal and produce a well marked drop in temperature (2°-4°C.) (6 mg. per kg. bodyweight). The larynx was painted with 10% cocaine solution 10-15 minutes before passing the catheter in order to prevent coughing. A special board was used for holding the animal and taking X-rays.

Over 100 dogs were used, and by the method described above, and with appropriate dosage, what is regarded as lobar pneumonia was set up with constancy. With 0·05-0·00001 c.c. of the virulent Type I strain, the onset of symptoms was sudden and the disease ran a febrile course of 3-9 days (average 4 or 5 days) accompanied by increased pulse rate, cough, dyspnoea and prostration. These generally ended abruptly, usually in recovery with a sharp fall in temperature and pulse rate and rapid resolution of the lung lesion. A transient and mild bacteraemia occurred in some cases. The physical signs and X-ray findings were those of lobar consolidation involving one, two or more lobes. Spread which occurred was usually to adjacent lobes, sometimes to the opposite side.

With the larger doses (0·04-0·06 c.c. of Type I) about half of the dogs died and in these cases pronounced bacteraemia was common. With doses of 0·1 c.c. the injection regularly generalized early or late. In these cases consolidation was often incomplete and pyaemic complications were often found P.M. Pneumonia of the same character was produced by Type II pneumococci, but a larger dose was required.

The comment is made that if more than half of the total lung issue was consolidated death always ensued, and that the course of the acute phase and rapidity of resolution also contrasted with the features of the disease as seen in human beings. Most, but not all, animals which eventually recovered showed an early and markedly increased white cell count, chiefly of neutrophiles.

II. Studies were made in the lungs of 58 of the dogs which died or were killed during the experiments referred to in I. Several distinct types of lesion corresponding to different clinical features were found, one of which bore a close general resemblance to lobar pneumonia as seen in man. This type occurred in dogs in which the pathological changes remained localized to the lungs throughout, *i.e.*, the majority of the animals. The lesion was lobar in character, involving whole or continuous parts of lobes, and had a firm, airless liver-like consistency. Con-

solidation of most of the lobes was frequent. The histological characters were also like those of lobar pneumonia in man. The same type of vascular and cellular response was observed with stages of engorgement, red and grey hepatization, followed by complete resolution. The evolution of the process in the dog was, however, more rapid, resolution usually occurring before the stage of grey hepatization was reached (or had become advanced). Examination of large areas did not show the same uniformity of architecture or of cellular exudation as is seen in typical lobar pneumonia of man. The authors feel, however, that the likenesses are sufficient to warrant the use of the term lobar pneumonia for the characteristic localized process described.

Two other types of lesion were found. In one, a fulminating type characterized by marked bacteraemia and early death, there was a coalescent lobular pneumonia associated with great injury to the tissues. In the other, in which the generalized infection progressed more slowly and death occurred in 4-7 days, with extreme bacteraemia and usually pyaemic complications, the lungs were irregularly consolidated and sometimes partially collapsed. In these cases the histological picture showed a combination of lobar, coalescent and non-coalescent lobular pneumonia with some suggestion of interstitial pneumonia, and is designated an irregular diffuse pneumonia.

III. Observations are presented on the successive changes which lead to the typical lesions already described. They are based on a study of 19 dogs killed at 1, 3, 6, 12 or 24 hours after the implantation of various doses in the terminal bronchus. Within one hour a local reaction had occurred consisting of a central area of infiltration, haemorrhagic and exudative in character, surrounded by alveoli filled with oedema in some parts and starch in others, and accompanied by engorgement of the blood vessels, the larger of which showed perivascular oedema. The lesion extended radially, with an advancing zone of oedema-filled alveoli, which in turn were gradually invaded by neutrophiles and erythrocytes until they were filled or distended by the exuded cells. Inflammation of the intra-alveolar septa was inconspicuous, but peribronchial and perivascular oedema was marked. At first peribronchial and lobular, the lesion soon became a continuous area, chiefly of intra-alveolar cellular exudate, and by 6-12 hours suggested the mosaic appearance of the typical human lobar lesion. Within 24 hours a whole lobe was consolidated and spread had occurred to others. During the early hours, spread of the pneumococci is believed to occur chiefly through the lung parenchyma because the organisms are found in the walls of the normal alveoli beyond the oedema zone, but later they are apparently carried through the smaller air passages by oedema fluid.

At the edge of the lesion large numbers of pneumococci were found lying free in the oedema-filled alveoli, in the next zone, that of cellular exudate, they were fewer and lay partly in the neutrophiles, whilst in the oldest part of the lesion showing intense infiltration they were few and nearly all intracellular.

The propagation of pneumococcus infection in the lung of the dog is discussed at some length, together with other apposite work. The three papers are excellently illustrated and tabulated.—A. W. Stableforth.

Gunn, F. D., & Nungester, W. J. (1936). **Pathogenesis and Histopathology of Experimental Pneumonia in Rats.**—*Arch. Path.* **21.** 813-830. 2 figs. [10 refs.]

A description is given of the lesions in rats resulting from the intrabronchial insufflation of pneumococci suspended in mucin. The method was that found earlier by Nungester and Jourdonais [*V. B.* **7.** 64.] to give regularly successful

results, and consisted of the injection of small doses of broth culture (10^{-4} c.c. in 0·1 c.c. of sterile mucin of relative viscosity 4·5-5·0; or, in some cases doses of 10^{-5} or 10^{-6} c.c.) intrabronchially by means of a canula and fine catheter under light ether anaesthesia. Indian ink was also incorporated in the injection in some cases.

One hundred and ten rats, including six controls with mucin alone or mucin and indian ink, were injected and killed after intervals of from one hour to 11 days. The same strain of Type III pneumococcus was generally used, but in a few experiments a Type I strain was used with similar results.

The lesion usually began at the base of the lung near the diaphragmatic border. The size of the initial lesion was determined by the distribution of the inoculum. The entire inoculum commonly went to one place, but if it was widely distributed the lesion was formed by the coalescing of several foci of oedema and leucocytic exudate. After a few hours, during which the pneumococci increased, the lesions began to spread rapidly in all directions, until arrested by the pleural membrane. The most important mode of spread is believed to be by the flow of oedema fluid through the smaller air passages and pores of Cohn, the bacteria multiplying rapidly in this fluid so long as it is poor in leucocytes. Active migration of leucocytes containing pneumococci is believed to be another probable mode of spread.

The first cellular reaction is that of septal cells, and this is followed quickly by infiltration by polynuclear leucocytes which soon predominate in the exudate. Erythrocytes and fibrin are also regularly present, but vary in relative concentration, the amount of fibrin depending apparently on the intensity of the irritation. Evidence of beginning resolution may appear as early as 24 hours after infection and is usually evident within 48 hours, but in lungs which have been entirely involved it is nearly seven days or more before resolution is complete. Shrinkage of the fibrinous exudate is usually to be seen within about three days, resulting in a mosaic appearance like that found in advanced croupous pneumonia in human beings. Resolution is characterized by the presence of macrophages. These appear to arise chiefly from the local proliferation of septal cells and are mainly, if not entirely, responsible for the liquefaction of fibrinous exudate. Residual thickening of the alveolar walls remains after resolution, and is due largely to the increased number of swollen septal cells.—A. W. Stableforth.

Beveridge, W. I. B. (1937). **Note on an Infection of Sheep with a Pasteurella-Like Organism.**—*Aust. vet. J.* **13.** 155-157. 1 table. [6 refs.]

In a group of ten merino lambs subjected to daily drenching with larvae of *Haemonchus contortus*, three developed diarrhoea, and of these two died and one was killed *in extremis*. B. conducted a P.M. examination on two of these three animals and in both found small necrotic lesions in the liver and pneumonic areas in the lungs. An organism resembling a pasteurella was isolated from the lesions, and laboratory tests indicated a marked similarity to the organism isolated by Dungal in Iceland from sheep affected with contagious pneumonia. [Similar organisms have recently been isolated by Montgomerie, Bosworth and Glover (1938) from cases of enzootic pneumonia of sheep in North Wales—see below].
—T. S. Gregory.

Montgomerie, R. F., Bosworth, T. J., & Glover, R. E. (1938). **Enzootic Pneumonia in Sheep.**—*J. comp. Path.* **51.** 87-107. 6 tables. [18 refs.]

An enzootic form of pneumonia is described in sheep in North Wales and East Anglia. The symptoms included a mucoid nasal discharge, coughing, shallow

respirations of the abdominal type and a rise in body temperature. In some cases death occurred as soon as 12 hours after the detection of symptoms ; other animals died or were killed 5-7 days later, and a considerable number recovered. The losses rarely exceeded 15 % of the flock. Ewes and rams were affected, irrespective of bodily condition. Faulty hygienic conditions and unfavourable weather appear to have been predisposing factors.

The lesions were those of an acute broncho-pneumonia, with a secondary pleurisy arising by contiguity with the consolidated areas. From 18 out of 22 cases an organism related to the pasteurella group was isolated. The organism was encapsulated, haemolytic, indol-negative and of low pathogenicity for experimental animals, thus resembling Group I *Pasteurella*. Serologically, however, it was not identical with any of the recognized members of the group.

Intranasal instillation in healthy sheep of suspensions of affected lungs from natural cases was without effect. Intratracheal injection produced a mild localized pulmonary congestion. A combination of intratracheal and intravenous, or of intratracheal, intravenous and intrapulmonary inoculation resulted in severe illness or even death. The lesions consisted of a fibrino-gelatinous pleural exudate and a similar fluid distended the interlobular septa. Neither in the macroscopic or microscopic appearances was there any resemblance to the lesions found in natural cases of the disease. Similar results were obtained with cultures of the organism.

It is suggested that although the organism itself may not be the primary causal agent, it may be able to establish itself in the lungs following the action of some other factor, *e.g.*, a virus or environmental influences. The disease bears a close resemblance to that described in Iceland by DUNGAL [(1931). *J. comp. Path.* **44.** 126]. No evidence was obtained of direct transmission under natural conditions from affected to healthy sheep.—E. G. WHITE.

STEWART, C. M. (1938). **Non-Sweating in Horses.**—*J. R. Army vet. Cps.* **9.** 161-170.

Attention is drawn to the fact that little of value is known about " non-sweating " or " dry coat " in horses, and S. hopes that this description of his experiences with the condition and his ideas on it may be of some use to future investigators.

The incidence, common symptoms and treatment of the disease are discussed, followed by a description of lesions found P.M. S. then suggests that the condition is due to chronic arsenical poisoning, and sets out his reasons for such a hypothesis, all based on his knowledge of the symptoms and lesions of the disease, and of the habit of those in charge of many racing stables in India of giving arsenic in large doses to their horses.—F. J. ANDREWS.

HRUŠKA, K. (1938). Nakažlivá obrna vepřu a fibrinosní zánět seros a kloubů selat. [**Porcine Enzootic Encephalomyelitis and Fibrinous Arthritis of Piglets**].—*Zvěrolék. Rozpravy.* **12.** 37-42 and 49-51.

H. refers to the main distinguishing signs that should be adopted for the differential diagnosis of porcine enzootic encephalomyelitis [sometimes called Teschin disease] and fibrinous arthritis of piglets. It is sometimes difficult to distinguish clinically between the two infections.

Enzootic encephalomyelitis is caused by an ultrafiltrable neurotropic virus. The chief clinical feature is paralysis. Characteristic histological findings in the central nervous system are those of non-purulent lymphocytic encephalomyelitis; there are no typical lesions in other organs. The infection is transmissible only to pigs. A carbolized emulsion of brain tissue is used as a vaccine.

The aetiology of fibrinous arthritis of piglets is unknown. Bacteriological examination yields negative results. Pathological changes are arthritis and gastro-enteritis, and the histological changes are those of cerebrospinal leptomeningitis; there is a close similarity with human rheumatism.—E. PŘIBYL (BRNO).

CUILLÉ, J., & CHELLE, P. L. (1938). La tremblante du mouton est bien inoculable. [**Scrapie in Sheep is Certainly Transmissible**].—*C. R. Acad. Sci., Paris.* **206.** 78-79. [1 ref.]

The authors had shown previously [*V. B.* **7.** 625.] that scrapie could be transmitted to healthy animals by intra-ocular inoculation of nervous tissue. One of the experimentally infected sheep was killed in a paralysed condition, and the brain and lumbar cord were emulsified in normal saline. Three normal sheep were inoculated with varying doses of brain emulsion by the epidural, subcutaneous and intra-ocular routes respectively; four more were inoculated with cord emulsion, one epidurally, one subcutaneously, and the last two intra-ocularly. Of the seven sheep, two died of intercurrent infections, and two developed the classical symptoms of scrapie. Both the latter had received the cord suspension; one inoculated epidurally developed symptoms 12 months, and the other 19 months, after subcutaneous inoculation. The three remaining sheep still had not developed symptoms 26 months after inoculation. Thus, of the eight sheep inoculated which did not die or were killed prematurely, five developed scrapie. The authors conclude on the basis of these observations that the disease is transmissible by inoculation, after an exceptionally long incubation period of at least one, and more probably two, years.—A. WILSON TAYLOR.

MÜLLER, A. (1938). Chemische Studien am ikterischen Harn. [**Chemical Studies on the Urine in Jaundice**].—*Hoppe-Seyl. Z.* **251.** 1-13. 3 tables. [20 refs.]

It is claimed that the urine of patients affected with icterus contains a hitherto undescribed "acid-activated" form of bilirubin. Some of the characteristic properties of this substance are recorded, and in describing the manner in which it differs from ordinary bilirubin, M. draws an analogy between oxyhaemoglobin and ordinary haemoglobin.—E. J. PULLINGER.

MORIN, L. N. (1938). **Studies of a Malady in Sheep.**—*J. Amer. vet. med. Ass.* **93.** 32. [1 ref.]

A disease which occurred in a flock of 300 lambs was manifested by bilateral ophthalmia without lachrymation, and by dullness, "pushing", "circling" and paralysis terminating in death. The disease was not invariably fatal. There were no obvious lesions on autopsy, but a listerella-like organism was isolated from the cases examined. [No bacteriological details are given. See also GILL—*V. B.* **8.** 73].—D. L. HUGHES.

SCHLEGEL, M. (1938). Fremdkörper und Karies in Zähnen beim Pferde. [**Foreign Bodies and Dental Caries in the Horse**].—*Berl. Münch. tierärztl. Wschr.* Sept. 2nd. 525-529. 2 figs. [18 refs.]

It is mentioned that foreign bodies (short nails) embedded in the cement of molar teeth are occasionally found in the horse and pig. A detailed description is given of the finding of a hobnail in a horse's premolar, with accompanying caries. The incidence of caries in various domestic animals is given, and possible reasons for the differences between the condition in man and the various species of animals are discussed. In man and in carnivora, caries commences with destruction of

the enamel, whereas in the horse and in ruminants the disease primarily affects the cement, the enamel and dentin being only secondarily involved.

Caries is classified, according to the site at which it begins, as superficial (on the grinding surface), interstitial (surface adjacent to neighbouring teeth) and central (commencing in the pulp cavity). Porodontia (exposure of the pulp cavity) and pulpitis are also discussed.—E. G. WHITE.

DAUBNEY, R., HUDSON, J. R., & ANDERSON, J. (1938). **Preliminary Description of a Form of Sterility in Cattle Associated with Vaginitis in Female Stock and with Chronic Changes in the Epididymis and in the Testicles of Bulls.** —*E. Afr. agric. J.* **4.** 31-34. 1 fig., 2 tables.

A disease causing bovine sterility is described, the first cases being observed in Kenya about 1928. Available evidence suggests that it is spread by coitus. Of 248 bulls examined on during the last two years on farms owned by Europeans, 86 showed high fertility, 32 reduced fertility, 25 " temporary sterility ", and 105 complete sterility. Among the sterile bulls epididymitis was the most common lesion.

In females the disease is associated with severe nodular vaginitis accompanied by a yellowish slimy discharge. In both cows and bulls there may also be dry adhesive peritonitis.

The condition is being combated by treatment of the cases of vaginitis with antiseptic preparations and by the general employment of artificial insemination. —J. G. MURRAY.

I. ANON. (1935). **Relationship between Hairless Calves in California and Texas Herds.**—*J. Hered.* **26.** 355-356. 1 chart.

II. REGAN, W. M., MEAD, S. W., & GREGORY, P. W. (1935). **An Inherited Skin Defect in Cattle. The Occurrence of a Sub-Lethal Epithelial Defect in a Jersey Herd, and a Plan for Eliminating Lethal Genes.**—*Ibid.* 357-362. 2 figs., 2 tables, 2 charts. [6 refs.]

III. WIPPRECHT, C., & HORLACHER, W. R. (1935). **A Lethal Gene in Jersey Cattle.**—*Ibid.* 363-368. 2 figs., 3 tables, 2 charts. [11 refs.]

IV. GOWEN, J. W. (1937). **Contribution of Genetics to Understanding of Animal Diseases.**—*Ibid.* **28.** 233-240. 4 figs. [Numerous refs.]

V. EATON, O. N. (1937). **A Summary of Lethal Characters in Animals and Man.**—*Ibid.* 320-326. [8 refs.]

I. This and the two articles which follow it, deal with hairlessness as a genetic lethal or sub-lethal factor in calves in California and Texas. In both States the condition occurred during in-breeding experiments on two different Jersey strains. In both cases the gene was a simple recessive. It appears that the same gene was responsible for the defect, and its origin was traced to a bull common to the pedigree of both herds.

II. The recent trend towards breeding from a small number of proven sires affords an opportunity for the segregation of recessive lethal genes. In a herd of pure-bred Jersey cattle used for in-breeding, four calves with epitheliogenesis imperfecta neonatorum were produced ; three of them were born alive, and of these one lived six hours and the remaining two were killed 15 hours after birth. A scheme is suggested by which it is hoped to eliminate a recessive lethal defect in a Jersey herd by selected breeding on genetic principles ; the scheme is still in the experimental stage.

III. Seven hairless calves are recorded in a Jersey herd at periods of pregnancy varying from 142 to 264 days. The presence of large hairless areas

was accompanied by incomplete hoof development and, in some cases, there was a wry tail. The herd was free from tuberculosis and contagious abortion. The proportion of normal to hairless calves was 7 : 1. This is within the expected ratio of an inherited character due to a simple recessive gene. The gene was not sex-linked.

IV. Disease in animals in relation to genetics has received too little attention largely due to the insistence on the importance of bacteria and on campaigns of eradication, vaccination or immunization. The production of disease-resistant strains in plants preceded by many years the realization of the importance of the host in animal diseases.

Examples of lethal genes mentioned include melanosis of the femoro-tibial joint in *Drosophila* which prevents movement and results in death ; a number of lethal and semi-lethal genes are known in this fly. In cattle, examples include achondroplasia in the Dexter breed, inherited epithelial defects, and cataract. In the mouse, imperforate vagina is the result of a recessive gene ; a form of anaemia in this species is also inherited. In the g. pig, deficiency of complement may be inherited and results in considerable differences in the effects of spontaneous and experimental infections. Resistance of certain strains of animals to tumours is another example of the influence of genetic factors.

G. has found that tobacco mosaic virus has attributes similar to those possessed by genes, being inactivated by ultra-violet light and X-rays in the same quantitative relation.

V. Many of the defects now known to be the result of lethal genes have long been known and described as anatomical monstrosities, but their connexion with genetics is a recent development. A comprehensive list of such conditions in animals and man is given, with references. They include the following :–

(1) Cattle.—(a). Achondroplasia (Dexter and African cattle), resulting in abortion usually during fourth month of pregnancy, a dominant character. Similar condition in Telemark and Holstein cattle fatal a few days after birth, a single recessive character. (b). Anchylosis of the mandibular articulation and shortening of the jaw. (c). Congenital dropsy. (d). Congenital icthyosis and epitheliogenesis imperfecta ; these may be related conditions. (e). Foetal resorption. (f). Hypotrichosis congenita (hairlessness). (g). Muscle contracture. (h). Mummification of the foetus.

(2). Horses.—(a). Atresia coli. (b). Stiff forelegs ; the young cannot stand, and usually die.

(3). Sheep.—(a). Absence of claws. (b). Earlessness and cleft palate. (c). Muscle contracture. (d). Paralysis of hind limbs. (e). Skeletal defects—reported in Iceland.

(4). Pigs.—(a). Atresia ani. (b). " Catlin mark "—opening between parietal and frontal bones ; animals die within an hour of birth. (c). Cleft palate. (d). Excessive adiposity. (e). Foetal mortality. (f). Hypotrichosis (hairlessness). (g). Muscle contracture. (h). Paralysis.

(5). Poultry.—(a). Abnormal superior maxilla—absent or reduced in size ; chicks rarely hatch. (b). Chondrodystrophy. (c). Dwarfs. (d). Broken flight feathers.

(6). Cats.—Lethal white—embryos of homozygous white die *in utero*.

(7). Dogs.—(a). Cleft palate reported in bulldog (recessive). (b). Hypotrichosis —animals born alive, die at an early age (dominant). (c). Paralysis—death of certain nerve cells at 8-14 weeks after birth ; not necessarily fatal (dominant).

Various lethal characters in the g. pig, mouse, rabbit, rat, canary and man are also listed.—E. G. White.

LÁSZLÓ, F. (1938). Riesenleber in Kälbern. [**Giant Liver in Calves**].—*Dtsch. tierärztl. Wschr.* **46.** 485-487.

Three cases of giant liver were found in 60,000 calves examined. In one case the liver was macroscopically normal in structure except for size ; microscopically only a slight increase in interlobular connective tissue was found, but the parenchymatous cells were increased in size and were irregularly arranged, and in many lobules the intralobular vein was missing. This case was classified as a true hyperplasia and hypertrophy of the liver. The other two cases were classified as a " pseudo-cirrhosis " ; these livers were a brownish grey in colour, and tough, the increased inter-lobular connective tissue being apparent macroscopically. The parenchymatous cells were normal in places, but examination of many sections showed a gradual transition to the size and arrangement found in the first case.

—A. T. PHILLIPSON.

I. LETARD, E. (1936). L'anomalie et la maladie considérées comme caractères ethniques. [**Malformation and Disease as Inherited Characters**].—*Festschift J. U. Duerst.* pp. 189-195. 5 figs. Bern : Verbandsdruckerei. [In French].

II. VAN DER PLANK, G. M. (1936). Pathologie und Erblichkeit. [**Pathology and Inheritance**].—*Ibid.* pp. 233-237. 3 figs. [In German].

III. CARSTENS, P., WENZLER, G., & DÜRR, M. (1937). Einige Untersuchungsergebnisse über Vererbungserscheinungen beim Schwein. [**Inherited Conditions in Pigs**].—*Zuchtungskunde.* **12.** 205-217. 10 figs., 1 table. [Numerous refs.]

IV. STANG. (1938). Inzucht vom Standpunkt der neuzeitlichen Vererbungslehre. [**Inbreeding in the Light of Recent Knowledge on Genetics**].—*Wien. tierärztl. Mschr.* **25.** 309-313.

I. Several examples of inherited abnormalities are mentioned in the course of this paper, including hairlessness in the dog and cat. A pair of apparently normal siamese cats produced a litter containing two hairless male kittens ; a second litter included a female which developed alopecia when fully grown.

A peculiar inherited locomotor abnormality was encountered in rabbits from Marseilles and from Normandy. Affected animals frequently walk on the forelegs only, the hind legs being held vertically and the body being in the position taken by a man walking on his hands. Occasionally, a complete somersault takes place. Attempts are being made to produce a breed of " acrobatic rabbits ".

II. Seven cases of epitheliogenesis imperfecta equinum are described among foals of genetically related mares. Hairless areas of skin were found on the limbs and in some cases there was absence of a hoof. Histologically, there was an absence of hair follicles and skin glands. [A case of epitheliogenesis imperfecta in a foal was described by BERTHELSEN and ERIKSSON—*V. B.* **6.** 538.—and included histological and genetic investigations].

III. The results of researches published during the last few years in several articles are here summarized so as to be more readily accessible. Pigs used for the study of the genetic characters of atresia ani also carried the lethal factor responsible for " thick leg ", in which there is a marked thickening of the subcutaneous tissue usually of the forelegs—probably due to circulatory disturbances. In the male, atresia ani is fatal unless dealt with surgically. In the female, defaecation is usually possible owing to the presence of a recto-vaginal fistula. The lethal factors concerned in these two conditions were shown to be coupled.

A condition in which the iris is devoid of pigment and is white in colour (" Glasäugigkeit ") is shown to be due to a single dominant factor which follows the Mendelian law of inheritance.

These inherited conditions illustrate the possible dangers of inbreeding, but this procedure should, nevertheless, be utilised when necessary in order to produce and conserve valuable characteristics.

IV. This is a brief review of inbreeding in relation to human and animal genetics. The advantages and disadvantages are discussed, the latter including decreased fertility, increased number of still births, diminished milk yield and the appearance of a of lethal factors.—E. G. WHITE.

NUTRITION IN RELATION TO DISEASE

DODDS, G. S., & CAMERON, Hazel C. (1934). **Studies on Experimental Rickets in Rats. I. Structural Modifications of the Epiphyseal Cartilages in the Tibia and Other Bones.**—*Amer. J. Anat.* **55.** 135-165. 2 text figs., 14 figs. on 3 plates, 1 table. [8 refs.]

The authors describe the changes which take place in the region of the epiphyseal cartilage in the head of the tibia in normal and rachitic rats, between four and 12 weeks of age. The essential defect in rickets is a subnormal multiplication of the cells of the epiphyseal cartilage, deficient calcification of these cells, and the crushing of the soft tissue so resulting. The characteristic thickening of the epiphyseal cartilage is the consequence of defective absorption of cartilage from the diaphyseal side which forms a supporting matrix for the cells which ought to be undergoing calcification. In severe cases the thickened cartilage passes into a stage of inactivity, and after a time it is absorbed by cells at the border of the diaphysis which convert it into a characteristic metaphysis.

Excellent macro- and microscopical figures are given, and should be examined.
—J. E.

DODDS, G. S., & CAMERON, Hazel C. (1938). **Studies on Experimental Rickets in Rats. II. The Healing Process in the Head of the Tibia and Other Bones.** —*Amer. J. Path.* **14.** 273-296. 1 text fig., 24 figs. on 6 plates, 2 tables. [10 refs.]

The process of healing of experimental rickets produced in rats by the Steenbock-Block diet is described in detail from studies of haematoxylin-eosin sections, silver preparations and frequent X-ray photographs; the 12 X-ray stages of Bourdillon were used as a scale for measuring the progress of healing.

The first indication was calcification in the rachitic metaphysis close to the edge of the epiphyseal cartilage, whence it spread, first through the metaphysis towards the shaft and later to the cartilage towards the end of the bone. During the latter half of healing the shape of the bone became corrected; haematogenic marrow formed in the new end of the shaft which had been formed from the metaphyseal region; cupping of the diaphyseal line was corrected, the entire epiphyseal cartilage became normal in thickness and structure, and the reorganized trabeculae attained normal dense calcification.—R. ALLCROFT.

I. HOLMES, C. E., DEOBALD, H. J., & HERRICK, C. A. (1938). **Sulphur and Rickets.**—*Poult. Sci.* **17.** 136-142. 7 tables. [3 refs.]

II. DE RUDDER. (1937). Rachitisbekämpfung mit dem "Vitamin D-Stoss". [**Treatment of Rickets with a Single Large Dose of Vitamin D**].—*Merck's Jber.* **51.** 13-18. [9 refs.]

I. Feeding trials previously showed [*V. B.* **9.** 155.] that sulphur had a marked beneficial effect in preventing coccidiosis in chicks. Unfortunately, under

certain conditions, the sulphur feeding retarded growth and effected bone formation, resulting in "sulphur rickets". It was found that vitamin D played an important part in the prevention of sulphur rickets. In the experiments described in the present paper, sulphur in various forms was fed to chicks receiving additional vitamin D in the form of cod liver oil, or else by irradiation with a quartz mercury vapour lamp. In addition, one batch of chicks was given sulphur and allowed access to direct sunlight. In all, 1,023 chicks were placed on experiment.

It was found that in order to prevent sulphur rickets and retardation of growth after sulphur feeding the chicks had to have access to direct sunshine. In the groups fed cod liver oil, if less than 2% of the ration was fed, both sulphur rickets and growth retardation resulted. If more than 2% was given to the sulphur-fed chicks, no sign of rickets was evident, but the retardation of growth was as great as in the groups fed less than 2%. Irradiation by means of the quartz mercury lamp appeared to counteract the production of rickets by the sulphur feeding, but growth was not normal, although the retardation was not so great as in the groups fed cod liver oil.

II. With no experimental data to corroborate his point of view, the author discusses the merits of a large single dose of vitamin D compared with many small doses in the cure of rickets in children. Even if his contentions are correct for human beings it is quite probable that they cannot be accepted as being true for dogs and farm animals.—James Stewart.

I. Malan, A. I., du Toit, P. J., & Groenewald, J. W. (1936). **Studies in Mineral Metabolism XXXV. The Role of Iodine in the Nutrition of Sheep.** —*Onderstepoort J. vet. Sci.* **7.** 523-532. 1 fig., 2 tables. [4 refs.] [See also *V. B.* **6.** 88].

II. du Toit, P. J., Smuts, D. B., & Malan, A. I. (1937). **Studies in Mineral Metabolism XXXVI. Fluorine Metabolism in Rats and Bovines.**—*Ibid.* **8.** 359-374. 6 tables. [Numerous refs.]

III. Theiler, A., du Toit, P. J., & Malan, A. I. (1937). **Studies in Mineral Metabolism XXXVII. The Influence of Variations in the Dietary Phosphorus and in the Ca : P Ratio on the Production of Rickets in Cattle.**—*Ibid.* 375-414. 15 figs., 11 tables. [Numerous refs.]

I. When the daily ration of merino ewes contained 0·05 g. KI for a period of about 12 months, no effects were observed on body weight and food consumption. Reproduction was, however, abnormal in all the groups receiving the KI supplement, the effects of which were more pronouncedly deleterious in sheep on a carotene-low diet than when 200 g. greenfeed were supplied daily. The response to increased protein feeding in the form of bloodmeal was marked by the detrimental effect of KI on reproduction. As all the rations could easily be improved both in quality and palatability it is not inferred that the quantity of KI given would adversely affect reproduction in sheep under ideal feeding conditions. The authors concluded, however, that when greenfeed is absent or inadequate, as frequently happens in practice, good quality protein is not available and the incorporation of KI in sheep licks is distinctly dangerous and may even cause losses due to abnormal reproduction.

II. Metabolism studies in fluorine were executed on bovines and rats. Fluorine was determined by the Willard and Winter method. Appreciable amounts of fluorine were retained by bovines on rations to which it was added in the form of CaF_2. Bovines retained approximately 2 g. and rats to whose diet 0·1% NaF was added retained approximately 1 mg. F per day under the conditions of the experiment. The percentage of fluorine occurring normally in ash of rats

varies from 0·039 to 0·05 %. The ash per 100 g. empty weight in rats was increased by fluorine feeding. The effect of F on Ca and P in rats was to decrease both elements, while in bovines Ca retention was slightly increased and the P retention pronouncedly decreased.

III. From the results obtained in a 24 months' experiment with growing Frieslands kept under conditions of abundant vitamin D and given low and sufficient P respectively in their rations, but with a varying Ca content, it was concluded that P deficiency invariably leads to rickets or osteomalacia and not to osteodystrophia fibrosa, which, it is suggested, is due to a deficiency of dietary calcium.

Neither the " Erdalkali-alkalizität " nor the Ca : P ratio of the ration was the determining factor in the development of rickets, but both these factors were associated with the severity of the disease produced. Histological examination of the bones was carried out to confirm or otherwise the biochemical findings.

A daily intake of approximately 20 g. P_2O_5, of which almost 60 % was retained by the body, was found to be sufficient for normal growth in the cattle used, whereas 13 g. was too little. Decreased food consumption of the animals receiving insufficient P was not wholly due to the insufficiency of P, but rather to a disturbance of the Ca : P metabolism in the animal.

DU TOIT, P. J., & MALAN, A. I. (1936). **Mineral Licks for Stock. I. Influence of Phosphorus-Deficiency on Pasture and Cattle.**—*Fmg S. Afr.* **11.** 177-180, and 195. 3 figs., 1 table.

This is a popular article for farmers on phosphorus deficiency in cattle. The function of minerals in the animal's body is discussed, particularly that of phosphorus. Pica is first discussed, with the two diseases which may be a result of it, *viz*, " stywesiekte ", or stiff sickness, and " lamsiekte " or botulism. The value of phosphorus feeding in areas where it is deficient is emphasized, and the forms in which it can be fed are discussed, such as bone-meal, degelatinized fine bone-meal, precipitated lime phosphates, rock phosphate and superphosphate and, finally, water-soluble phosphates.—E. M. ROBINSON.

HASTINGS, C. C. (1938). **Phosphorous Deficiency in a Heifer.**—*N. Amer. Vet.* **19.** No. 9. 26-28. 2 figs.

Four 17-month-old heifers at pasture exhibited signs of general unthriftiness, together with enlargement of the joints of the limbs. A description of the symptoms in the worst affected animal is given. Adult cattle on the same pasture were only slightly affected. The evidence—history of the cases, type of soil and herbage—suggested a phosphorus deficiency. All animals recovered when given 3 oz. of bone-meal daily plus a ration of oats, bran and clover hay.—N. J. SCORGIE.

SCOTT, R. B. (1938). **The Iron-Deficiency Anaemias.**—*Lancet.* **235.** 549-552. 2 tables. [7 refs.]

Anaemias due entirely to Fe deficiency are hypochromic and often microcytic, characterized by a low blood Hb content and a low colour index, with no alteration in the number of leucocytes. The broader aspects of iron metabolism are discussed and six different types of Fe-deficient anaemias are described, together with methods of diagnosis and subsequent treatment. In particular, it is emphasized that these hypochromic anaemias are almost always due to losses of blood from various causes, which are fully discussed, and that the first essential in treatment consists in accurate diagnosis of the cause of the anaemia and its subsequent correction.—ALFRED EDEN.

WINTROBE, M. M., MITCHELL, D. M., & KOLB, L. C. (1938). **Sensory Neuron Degeneration in Vitamin Deficiency. Degeneration of the Posterior Columns of the Spinal Cord, Peripheral Nerves, and Dorsal Root Ganglion Cells in Young Pigs Fed a Diet Containing Thiamin (B_1) and Riboflavin but Otherwise Deficient in Vitamin B Complex.**—*J. exp. Med.* **68.** 207-220. 19 figs. on 4 plates, 1 table, 4 charts. [12 refs.]

An artificial diet presumably adequate in all respects was given to three young pigs for some weeks, and then the quantity of yeast was gradually reduced while thiamin (vitamin B_1) and riboflavin were given in its place. The rate of growth decreased, the general condition of the animals became impaired, and marked ataxia, without motor weakness, developed. Histological examination showed there was a selective degeneration of the peripheral sensory neurone involving its cell body in the posterior root ganglion, the peripheral axone, and the central axone included in the posterior roots and in the posterior columns. No clear-cut abnormalities were seen in the anterior roots or anterior horn cells, and many bundles of well myelinated fibres, probably motor, were evident in sections of the peripheral nerves. The tissues other than those of the nervous system were either normal, or else showed the results of secondary infection.—R. ALLCROFT.

I. BIRCH, T. W., CHICK, Harriette, & MARTIN, C. J. (1937). **Experiments with Pigs on a Pellagra-Producing Diet.**—*Bio-chem. J.* **31.** 2065-2079. 4 tables. [Numerous refs.]

II. CHICK, Harriette, MACRAE, T. F., MARTIN, A. J. P., & MARTIN, C. J. (1938). **Experiments with Pigs on a Pellagra-Producing Diet. II.**—*Ibid.* **32.** 844-854. 3 figs., 1 table. [Numerous refs.]

I. Young weanling pigs were fed a diet similar to that with which GOLDBERGER produced blacktongue in dogs and which consisted of 83 parts of white maize, 11 of pea meal, 4·4 of purified casein, 3 of cod liver oil and 2·5 of a salt mixture. The animals became ill with severe diarrhoea in periods varying from 5 to 10 weeks and died unless the diet were changed ; they showed a progressive simple anaemia. *Post-mortem* examination showed a condition of necrotic enteritis of the caecum and large intestine.

Addition of 4% or 8% dried yeast or of a corresponding amount of an autoclaved aqueous yeast extract rendered the diet suitable for rearing pigs and effected dramatic cures of animals which had become seriously ill on the unmodified diet.

When a mixture of whole wheat and whole barley was substituted for the maize the diet became just satisfactory. The above " black tongue " diet without addition of yeast, on which the pigs sickened and died, was found satisfactory for rearing young rats.

II. Experiments showed that a pellagra-producing diet similar to that described above could be rendered suitable for rearing pigs by addition of a small daily ration (60 mg.) of nicotinic acid. It seems evident that nicotinic acid or nicotinamide was for pigs the only substance missing in the maize diets fed.

Young rats throve on maize diets of similar composition to those on which the young pigs sickened and died. When the intake was limited and the necessary calories and protein were made good with purified constituents, riboflavin deficiency was manifested, but no consistent advantage was obtained by giving nicotinic acid or nicotinamide. If one or other of these pyridine compounds is essential for the rat, the amount required must be very small.

From the results of the autopsies of five pigs that died, and the bacteriological observations made at the time, it is concluded that the ulceration and necrosis of the large gut were primarily due to the nutritional defect and that the bacterial invasion was a secondary phenomenon.—R. ALLCROFT.

CHICK, Harriette, MACRAE, T. F., MARTIN, A. J. P., & MARTIN, C. J. (1938). **Curative Action of Nicotinic Acid on Pigs Suffering from the Effects of a Diet Consisting Largely of Maize.**—*Bio-chem. J.* **32.** 10-12. 1 text fig., 2 figs. on 1 plate. [6 refs.]

Two pigs fed for some time on the unsupplemented maize diet described elsewhere by the authors [see previous abstract] developed severe diarrhoea and refused food; their skins were a dirty yellow and covered with scabs, and had lost most of the hair. In addition, one animal had paresis and spasticity of the muscles of the hind quarters, and it was anticipated that both would die within 2-3 days.

Most striking recoveries occurred after injections of 100 mg. of nicotinic acid followed by administration of 60 mg. daily with the food. The appetite returned within 24 hours of the first injection, the diarrhoea abated and the animals began to increase in weight. After six weeks' treatment the skin had the appearance of that of healthy pigs.—R. ALLCROFT.

DEUEL, H. J., Jr., HALLMAN, L. F., & MURRAY, Sheila. (1938). **Studies on Ketosis. XIV. Ketolysis Versus Antiketogenesis as an Explanation for the Action of Carbohydrate on Ketonuria.**—*J. biol. Chem.* **124.** 385-393. 2 tables. [13 refs.]

The administration of glucose, but not of ethyl alcohol, to fasting rats having an exogenous ketonuria produced by feeding sodium butyrate, was followed by a decreased excretion of acetone bodies. A similar difference between glucose and alcohol on the endogenous ketonuria was noted in fasting rats previously fed a high fat, low protein diet. Glucose brought about an almost complete abolition of the ketonuria, while ethyl alcohol was entirely ineffective. From these results it is assumed that ketolysis rather than antiketogenesis is the primary mechanism whereby the metabolism of carbohydrate brings about the abolition of ketonuria.
—R. ALLCROFT.

MACHAN, G. (1938). Untersuchungen über die Alkalireserve im Blutplasma kranker Kühe. **[The Alkali Reserve in the Blood Plasma of Diseased Cows].**—*Arch. wiss. prakt. Tierheilk.* **73.** 414-422. 1 table. [11 refs.]

The alkali reserve of the venous blood of 20 normal and 30 sick cows was estimated by the method of van Slyke. The values for the normal animals varied from 44·8 to 78·6 volumes % of carbon dioxide. Samples taken from five cows at two-hourly intervals over a period of two days showed variations of not more than 2·3%. Twenty of the sick animals showed a low alkali reserve; these were cases of digestive disturbances, acetonaemia, acute mastitis, peritonitis and lymphadenoma, the low alkali reserve appearing to be associated with the alimentary dysfunction which was present in all. If the rumen was opened to the air by means of a trocar and canula or if a permanent rumen fistula was left open, the alkali reserve fell very low—19-20%—rising slowly again when the opening was closed. The intravenous injection of bicarbonate solution into a normal cow produced a rise in alkali reserve which lasted 30 minutes.—A. T. PHILLIPSON.

PUBLIC HEALTH

HENNINGSEN, E. J., & ERNST, J. (1939). **Milk Epidemic of Scarlet Fever and Angina, Originating from a Milkmaid with Scarlatinal Otitis Media.**—*J. Hyg., Camb.* **39.** 51-59. 2 figs., 3 tables. [14 refs.]

An account is given of a streptococcus epidemic in Denmark with 118 cases

of scarlet fever and about 50 cases of sore throat, with one death. The evidence clearly pointed to the infection being milk-borne, the source being a milkmaid suffering from otitis media. Streptococci of Lancefield's Group A (Type 3 of F. Griffith) were isolated from 108 of the patients and from the discharge from the milkmaid's ear. The epidemic was considered to be due to direct contamination of the milk with streptococci, since the cows in the incriminated herd, and also their milk, were normal (two examinations at an interval of six days). [From the authors' statements it is not quite certain that this conclusion is justified. Thus, the difficulty of controlling conditions on farms cannot be overlooked. The authors admit that an epidemic affecting so many persons would have been unlikely to follow direct contamination of the milk unless the streptococci had actually multiplied in it. While admitting, however, that general experience favours the view that " streptococci of group A grow in raw milk but very poorly ", they did not study this point in the present case nor did they refer to the work of PULLINGER and KEMP—*V. B.* **8.** 407.—who carried out an exhaustive enquiry on the problem].—F. C. MINETT.

SUERMANN, H. (1937). Untersuchungen über die pH-Zahl und die Bakterienflora des Darminhaltes in den einzelnen Darmabschnitten im gesunden Zustand geschlachteter und notgeschlachteter Kälber und Kühe. Ein Beitrag zur Epidemiologie der Fleischvergiftungen. [**The pH and Bacterial Flora of the Intestinal Contents of Healthy Calves and Cows and of those Slaughtered in Emergency**].—*Inaug. Diss., Hanover.* pp. 71. 4 tables. [Numerous refs.]

S. found that the pH in normal calves fluctuated from 6·7 in the small intestines to 7·4 in the large colon, and in animals killed in emergency from 6·8 to 7·5. In adults nearly the same figures were found. The bacterial flora in the bowel contents of healthy animals was in general the same as in emergency-killed cases. The only important finding was the isolation of *Salmonella enteritidis* Gärtner from the intestinal contents of two emergency-slaughter animals and from one normal animal.—M. F. BENJAMIN.

I. STANDFUSS, R. (1938). Neuzeitliche Arbeitsweise bei der bakteriologischen Fleischuntersuchung. [**Modern Methods for Bacteriological Meat Inspection**].—*Berl. Münch. tierärztl. Wschr.* Sept. 2nd. 534-537, and Sept. 9th. 551-552. 2 tables. [18 refs.]

II. POHL, G. (1938). Bakteriologische Fleischbeschau und Anreicherung. [**The Use of Enrichment Methods in Bacteriological Meat Inspection**].—*Z. InfektKr. Haustiere.* **53.** 113-121. 1 table. [12 refs.]

III. BARTEL, H. (1938). Ueber einen neuen Elektivnährboden und seine Bedeutung für die bakteriologische Fleischuntersuchung. [**A New Selective Culture Medium for Bacteriological Meat Inspection**].—*Tierärztl. Rdsch.* **44.** 352-354. [2 refs.]

IV. SCHOOP, G. (1938). Saccharosezusatz zu Drigalski- Conradi- und Gassnernährböden. [**The Addition of Saccharose to the Drigalski, Conradi, and Gassner Culture Media**].—*Dtsch. tierarztl. Wschr.* **46.** 279-281. 2 figs., 2 tables. [11 refs.]

I. For isolating members of the genus *Salmonella*, the author advocates plating on brilliant green-phenol red agar to which may be added saccharose, adonite or salicin ; bovine testicle enrichment broth and ammonium broth may be used. Identification rests primarily upon an antigenic analysis firstly of " O "

factors, followed by that of " H " factors. Certain fermentation reactions may also be of great value for classification.

II. A discussion of the methods of examining carcasses for their suitability for food, special attention being given to the contamination of meat by salmonella. The site from which salmonella may most frequently be isolated is the gall-bladder, and thereafter the liver and periportal lymph nodes, the spleen, and the kidneys, in decreasing order of importance. P. stresses the value of inoculating tetrathionate broth for increasing the numbers of salmonella when these are scanty and difficult to isolate.

III. B. advocates the use of Petri dishes of indicator agar containing lactose, saccharose, salicin and adonite respectively. By cultivating the suspected material on such plates it is possible immediately to exclude a large proportion of late-lactose-fermenting coliform organisms. In this way serological examination may be reduced to a minimum.

IV. It is possible to identify most late-lactose-fermenting strains of coliform bacilli and distinguish them readily from salmonella by adding saccharose to Drigalski's, Conradi's or Gassner's selective media.—E. J. PULLINGER.

TARASOV, I. (1937). Konservacija *Br. melitensis* v ovečjem mjase v uslovijah zasola. [**Conservation of the *Br.m.* in Salted Mutton**].—*Brucellosis in Sheep.* pp. 419-422. 2 tables. Moscow, Viem. Publ. Dept.

Experiments on g. pigs showed that salted meat from brucella-infected sheep contained viable *Br.m.* for as long as 32 days, and might, therefore, be a source of infection for human beings. It is recommended that, in regions where the disease is prevalent, salted sheep-meat should not be issued for human consumption until at least one month after salting.

VERŠILOVA, P. (1937). Konservacija *Br. melitensis* v ovečjem moloke i v ovečjei brynze. [**Conservation of *Br.m.* in Sheep-Milk and Sheep-Cheese (Brynza)**]. —*Brucellosis in Sheep.* pp. 407-417. 4 tables. Moscow: Viem. Publ. Dept.

Experiments showed that in sheeps' milk with a pH of 6·8 to 6·0, *Br.m.* was viable for 22-40 days at a temperature of 11°C. At pH 5·0 to 4·0 the organisms were viable in milk kept at 11°C. for 15 days, but never for more than 30 days, while in milk kept at 37°C. they frequently perished during the first few days. They survived in milk containing 1-3% sodium chloride, but at concentrations of 5-8% they died out in 10-15 days at 37°C. and in 15-30 days at 11°C.

In a further set of experiments it was shown that in " brynza " cheese prepared from milk infected with *Br.m.* after pasteurization, the bacteria remained viable and infective to g. pigs for 45 days at 11°-14°C. The fact that " brynza " cheese made of unpasteurized milk may serve as a source of brucella infection for man is claimed to have been confirmed by epidemiological observations [see p. 228].

PIEPER, H. (1937). Der gegenwärtige Stand der Betäubungsweise an den deutschen Schlachthöfen unter besonderer Berücksichtigung der Betäubung der Kälber. [**Present Methods of Stunning Animals in German Abattoirs**].—*Inaug. Diss., Berlin.* pp. 87. 1 fig., 25 tables. [Numerous refs.]

P. describes the various methods for stunning animals practised in German abattoirs. The gist of his conclusions is that mechanical stunning by the "Schermer [captive bolt] gun " is superior to all other methods, especially for prevention of extensive haemorrhages, for cleanliness and rapidity, and on humanitarian grounds. —M. F. BENJAMIN.

MELLO, A., & MASTROFRANCISCO, N. (1938). A manteiga como veiculo de infecção pela Brucella. [**Butter as a Possible Vehicle of Brucella Infection**]. —*Rev. Industr. anim.* **1.** 19-27. 3 figs. [Numerous refs.] [English summary].

It is stated that 20% of dairy herds of Sao Paulo are infected with brucella, and that the percentage has doubled in a decade. The authors do not know of any case of human brucellosis contracted from bovines in Brazil.

Three different batches of butter were made, some from raw, and some from pasteurized milk, and infected with mixed *Br. abortus* and *Br. melitensis*, and various injections were made into g. pigs. The results varied, depending on the age and acidity of the butter, and some of the strains used are said to have been of low virulence.

The authors are of the opinion that butter or whey may act as a vehicle of brucella infection, but consider such transmission of infection to be rare.

—A. H. HUNTER.

THERAPEUTICS

MÖNNIG, H. O. (1936). **A New Fly Repellent and a Blowfly Dressing. Preliminary Report.**—*Onderstepoort J. vet. Sci.* **7.** 419-430. 1 fig., 7 tables. [1 ref.]

It was shown that the steam-distilled oil of the plant *Tagetes minima* had strong repellent properties for blowflies and that it was suitable for use in a blowfly dressing.

Carbon tetrachloride and tetrachlorethylene are excellent larvicides for use against blowfly maggots, but tetrachlorethylene is irritating on wounds. Both these drugs are distinctly more effective than benzene.

Emulsions of the above-mentioned substances are suitable as blowfly dressings, and woolgrease was found to be the most satisfactory emulsifier. Particulars are given regarding the preparation of a suitable emulsion.

POCKRANDT, D. (1937). Experimentelle Untersuchungen an Benzaldehyd-, Chlorphenol-, Chlorkresol-, Derris-, Kupferoleat-, Naphthalin-, Petroleum-, Pyrethrum- und Schwefeldioxydhaltigen Hautungezieferbekämpfungsmitteln. [**Trials of Ectoparasiticides**].—*Münch. tierärztl. Wschr.* **88.** 399-402.

Although P. found derris to be most effective against warble flies, she states that it is practically useless against *Haematopinus*. She carried out experiments on the lethal effect of the preparations named in the title, and states that they are, in general, more effective against ectoparasites, *e.g.*, *Trichodectes*, *Goniodes*, etc. than derris. The experiments were carried out by placing the parasites on blotting paper soaked in the solution under test, so that they were never immersed in the solution.—M. F. BENJAMIN.

KING, H., LOURIE, E. M., & WARRINGTON YORKE (1938). **Studies in Chemotherapy. XIX. Further Report on New Trypanocidal Substances.**—*Ann. trop. Med. Parasit.* **32.** 177-192. 12 tables. [7 refs.] [See also *V. B.* **8.** 659].

Following the discovery that synthalin has a powerful direct trypanocidal action, a number of guanidines, isothioureas, amines, with alkyl and alkylene chains, were examined for trypanocidal activity. Certain of the diamidines exhibited a powerful trypanocidal action *in vitro*, and the most active member of the series (n. undecane—I : II—diamidine) produced permanent cures in mice and rabbits

injected with *Tryp. rhodesiense*. Undecane had little curative action on mice infected with *Tryp. congolense*, but when given in large doses on the day of inoculation and on the following nine days it had a marked prophylactic action. It had a definite action on human simple tertian malaria, causing the parasites to disappear from the peripheral blood, and the febrile paroxysms to cease. A number of aromatic amidine and guanidine compounds were prepared, and several of these exhibited marked trypanocidal action *in vitro*. Three of them cured mice infected with *Tryp. rhodesiense*. This work opens up a new field in the search for substances of therapeutic value against trypanosomal and malarial infections.—J. M. Robson.

van Rensburg, S. W. J. (1938). **Surfen C. therapy in** *Trypanosoma congolense* **Infection in Bovines and Ovines.**—*Onderstepoort J. vet. Sci.* **10.** 13-20. 2 tables. [9 refs.]

A review of the literature is given. It is pointed out that the reports on the efficacy and toleration of Surfen C show that the results obtained with the drug in various parts of Africa are conflicting. The results obtained by the author at Onderstepoort were disappointing, and he concludes :– (1) that intramuscular injection of Surfen C in the treatment of *Tryp. congolense* infection in bovines and ovines is ineffective, and (2) that the intramuscular injection of Surfen C into bovines causes a serious local reaction.

Buttle, G. A. H., & Parish, H. J. (1938). **Treatment of Tuberculosis in Guinea-Pigs with Sulphanilamide.**—*Brit. med. J.* Oct. 15th. 776-777. [1 ref.]

Sulphanilamide appeared in some degree to inhibit infection of g. pigs with a human strain of TB. When a bovine strain was used, the drug had very little influence on the course of infection in g. pigs, and none at all in rabbits.—J. M. R.

Ortlepp, R. J., & Mönnig, H. O. (1936). **Anthelminthic Tests, Chiefly with Tetrachlorethylene, for the Removal of the Hookworm,** *Gaigeria pachyscelis* **from Infested Sheep, with Observations on the Effects of this Drug on Other Parasitic Nematodes.**—*Onderstepoort J. vet. Sci.* **7.** 399-418. 1 fig., 8 tables. [14 refs.]

Tetrachlorethylene in doses of up to 10 c.c., carbon tetrachloride up to 6 c.c., and pyrethrum extract up to 5 c.c. had no effect alone against *Gaigeria* in sheep, but when administered in an equal volume of liquid paraffin after 2·5 c.c. of 10% copper sulphate solution, 5 c.c. of tetrachlorethylene was moderately effective, while doses of 7·5 c.c. and 10 c.c. were fairly effective in removing the parasites. Three doses of 10 c.c. of tetrachlorethylene at intervals of 10-14 days practically cleaned a heavily infested flock, directly or indirectly, of *Haemonchus*, *Trichostrongylus*, *Gaigeria* and *Oesophagostomum*.

An emulsion of the drug overcame the undesirable effects—coughing and choking—produced by the liquid paraffin mixture.

Preliminary experiments made in attempts to reduce absorption of the drug from the intestine which causes giddiness are described.

Kraneveld, F. C., & Djaenoedin, R. (1937). Stephanofilariosis. VIII. Oriënteerend onderzoek betreffende de therapie van het lijden. **[Stephanofilariasis. VIII. Treatment].**—*Ned.-ind. Bl. Diergeneesk.* **49.** 332-348. 4 figs. on 2 plates. [English and German summaries]. [See also *V. B.* **7.** 76].

A search was made for a therapeutic agent against stephanofilariasis which would be inexpensive and quickly effective, and be safe in the hands of farmers,

No agent was found fulfilling all these conditions, but the best results were obtained with remedies containing arsenic, *e.g.*, Cooper's " lavene " and "Cooper's dip."
—JAC. JANSEN (UTRECHT).

SCHREYER, W. (1938). Vigantol in der Tiermedizin. [**Vigantol in Veterinary Medicine**].—*Merck's Jber.* **51.** 71-75.

A general note on the uses of vigantol, which is a standardized vitamin D preparation made from irradiated ergosterin. It has been used for the past ten years in the treatment of domestic animals and animals in zoological collections affected with forms of avitaminosis-D, such as rickets, osteomalacia and weakness in parturient cows (the so-called " Festliegen ").—J. E.

WYSSMANN, E. (1938). Die parenterale Phenoltherapie beim infektiösen Abortus des Rindes. [**Parenteral Phenoltherapy in Bovine Brucellosis**].—*Schweiz. Arch. Tierheilk.* **80.** 229-250. 1 fig. [Numerous refs.]

A careful investigation of the possible value of injections of phenol as a method of treating bovine contagious abortion showed that such a procedure had no therapeutic value. Furthermore, W. points out that such injections can cause serious oedema and may even activate latent gas gangrene infections.—E. J. P.

POISONS AND POISONING

MILLER, W. T., & SCHOENING, H. W. (1938). **Toxicity of Selenium Fed to Swine in the Form of Sodium Selenite.**—*J. agric. Res.* **56.** 831-842. 3 figs., 4 tables. [9 refs.]

Eight pigs, four months old, were fed an adequate ration to which were added amounts of Se (as Na_2SeO_3) varying from 24·5 to 392 p.p.m. In four animals, clinical symptoms became manifest in 10-99 days, and included loss of hair, alteration in the growth of the horn of the hoof, diarrhoea, posterior paralysis, and loss of condition, ending in death. P.M. examination revealed lesions in the viscera and in the joints and bones. These lesions and clinical symptoms resembled those occurring in the natural " alkali disease " amongst pigs. The loss of weight which occurred may have been due to the pigs' aversion to the seleniferous food, an aversion which has been noticed when naturally seleniferous grain has been fed.
—ALFRED EDEN.

ROETS, G. C. S. (1937). **The Distribution and Possible Translocation of Icterogenin in *Lippia rehmanni* (Pears).**—*Onderstepoort J. vet. Sci.* **9.** 583-587. 1 table. [14 refs.]

Icterogenin may be present in variable amounts in the leaves and inflorescence of *L.r.*, whereas only traces are found in the stem and root stele. There is a possible translocation of the toxic substance to the root cortex from the leaves, where presumably it is formed. The further possibility exists that the icterogenin so stored in the root cortex may under certain specific conditions be translocated to the leaves of the plant.

The stage of growth does not appear to be of great importance as far as the toxicity of the plant is concerned. Pruning and cutting cause a marked increase in the concentration of icterogenin in both the leaves and the root cortex. Climatic conditions may to a large extent influence the synthesis and translocation within the plant tissues.

SUTTON, G. D. (1938). **Is the Syringa Berry** (*Melia azederach* **L.**) **Poisonous for Cattle ?**—*J. S. Afr. vet. med. Ass.* **9.** 75.

Two cases are described in cattle where symptoms of poisoning were apparently due to eating syringa berries, as these were found in quantities in the rumenal and abomasal contents. The symptoms were those of weakness, trembling if made to stand, frothy discharge from the nose, and congestion of the conjunctiva. The temperature was normal. Autopsy revealed congestion of the internal organs, ecchymoses on the heart, and marked pulmonary oedema.—E. M. ROBINSON.

STEYN, D. G. (1937). **The Toxicity of Oil of Turpentine for Domestic Animals.** —*Onderstepoort J. vet. Sci.* **9.** 591-598. 1 table. [9 refs.]

Drenching experiments with mixtures of raw linseed oil, oil of turpentine and extract of male fern were conducted upon horses and rabbits. The following mixture appeared to constitute no danger to full-grown horses in fair condition and in good health :– 120 c.c. (4 oz.) of oil of turpentine, 4 c.c. (1 drachm) of extract of male fern, and 600 c.c. (1 pint) of raw linseed oil. Contra-indications are congestion of the kidneys, nephritis or gastro-enteritis.

The toxic doses, symptoms of poisoning, P.M. appearances and treatment of cases of oil of turpentine poisoning are discussed.

PHYSIOLOGY

MANRESA, M., & REYES, N. C. (1934). **Hematological Studies on Cattle. I. The Hemoglobin, Erythrocytes and Leucocytes in Different Breeds of Cattle in the College of Agriculture.**—*Philipp. Agric.* **23.** 588-603. 9 tables. [6 refs.]

There is rapid degeneration and a heavy mortality among pure-bred cattle from temperate zones when introduced into the Philippines. The work here described was undertaken to examine any changes occurring in the blood of various breeds of cattle and of various crosses. Haemoglobin estimations and blood counts were carried out at 30-day intervals over varying periods. The four pure breeds examined were Indian Nellores, Natives, Holsteins and Herefords, the average haemoglobin content of these being 9·87, 9·43, 8·28 and 6·76 mg. per 100 c.c. blood respectively. The haemoglobin index remained fairly constant and showed no correlation with the white cell count. Animals in poor condition showed a low haemoglobin content. Various crosses of these four breeds were examined, and it is concluded that the haemoglobin content of the blood is useful in determining the adaptability of different breeds.—A. T. PHILLIPSON.

HERTHA, K. (1938). Nachweis von Nerven im Nabelstrang von Föten und einer Nervenverbindung zwischen Mutter und Frucht. [**Demonstration of the Existence of Nerves in the Umbilical Cord of Foetuses, and of Nervous Connexion between Mother and Embryo**].—*Tierärztl. Rdsch.* **44.** 503-509. 2 figs.

The existence of nerve fibres can be demonstrated histologically in the umbilical cord of g. pigs. A peculiar reaction was shown to occur in g. pig foetuses more than three weeks old when the skin, muscles, blood vessels or peripheal nerves of the dam were injured by crushing or by heat, electrical and chemical stimulation having no effect. If the saphenous nerves of the mother were pinched or warmed, the vessels of the corresponding area of the foetus were shown subsequently to be very dilated, especially the veins. Similarly, crushing of the muscles or of the veins of the dam produced a haemorrhagic condition and dilatation of the vessels

in the corresponding areas of the foetus, while searing the skin of the dam had a similar effect. Local anaesthesia of the areas before injury prevented the occurrence of the phenomena. Cases are quoted where a haemorrhagic area was found on the forehead of foetuses of pigs and cattle when the mother had been stunned several minutes before bleeding at slaughter.—A. T. PHILLIPSON.

QUAST, P. (1937). Die graphische Registrierung der Pansen- und Labmagenbewegungen des Schafes unter besonderer Berücksichtigung des Wiederkauens. **[Graphic Registration of Rumen and Abomasum Movements in Sheep].**—*Inaug. Diss., Berlin.* pp. 20. 5 figs. [9 refs.]

Fistulae of the rumen and of the abomasum were made in five sheep and pressure tracings were taken by means of Bruggemann's double balloon method. Sixty experiments were made. With each it was necessary to empty the abomasum of ingesta. The tracings obtained from the dorsal sac of the rumen and from the abomasum showed a distinct rhythm; variations occurred, and were most pronounced in the latter organ. Tracings from the abomasum were interpreted as showing waves of increased tonus, which immediately followed a contraction of the rumen, and also peristaltic waves. Both after feeding and during rumination the frequency of the rumen and abomasum contractions were increased, and showed greater regularity. Ingesta returned to the mouth immediately before a contraction of the rumen, when abomasal tonus was at its lowest. This work is of interest in that previously the graphic method had been used only on cattle.—A. T. PHILLIPSON.

MALAN, A. P., & CURSON, H. H. (1937). **Studies in Sex Physiology No. 18. On the Growth of the Gravid Uterus in the Merino.**—*Onderstepoort J. vet. Sci.* **8.** 417-428. 5 tables, 6 charts. [3 refs.] [See also *V. B.* **6.** 275].

Expressed as a percentage of the weight of the ewe, the growth of the gravid uterus during gestation is approximately given by W in the equation $W = 0{\cdot}000081t^{2{\cdot}48}$, where t is equal to the gestation age in days. Tables and charts are presented to show the increase in the separate constituent parts of the gravid uterus when their weights are expressed as percentages of the weight of the ewe, of the weight of the gravid uterus and of the weight of the foetal sac. Of these parts the most pronounced growth occurs in the foetus.

MALAN, A. I., MALAN, A. P., & CURSON, H. H. (1937). **Studies in Sex Physiology No. 19. The Influence of Age on (a) Amount and (b) Nature and Composition of the Allantoic and Amniotic Fluids of the Merino Ewe.**—*Onderstepoort J. vet. Sci.* **9.** 205-221. 5 figs., 4 tables, 3 charts. [11 refs.]

An analysis was made of the amniotic and allantoic fluids both at full term and at the end of each month of pregnancy. A greater alkalinity was noted in the earlier stages than later. The allantoic fluid was significantly higher in total solids per 100 c.c. than the amniotic fluid, and there was a noticeable increase round about the third month, but there was no further rise. The total N content of the allantoic fluid was much higher than that of the amniotic fluid. Phosphorus and calcium were also higher in the allantoic fluid, but did not show much fluctuation during pregnancy. There was a marked uniformity in composition between the allantoic fluids of the pregnant and non-pregnant horns of the uterus.—E. M. R.

SPRUNT, D. H., MCDEARMAN, Sara, & RAPER, J. (1938). **Studies on the Relationship of the Sex Hormones to Infection. I. The Effect of the Estrogenic and Gonadotropic Hormones on Vaccinia and the Spreading Factor.**—*J. exp. Med.* **67.** 159-168. 5 tables. [12 refs.]

The authors' experiments in which young castrated male rabbits were used,

seem to indicate that in oestrone there is some factor which has an effect on the tissues of the animal body opposite to that of simple extracts of the testis.

After subcutaneous administration of oestrone in doses of 2,000 international units daily for seven days, the spread of indian ink injected subcutaneously was retarded, but reached and exceeded the normal spread after 24 hours. After oestrone had been administered for three weeks, the spread of indian ink was much less than in control animals, and the resistance to vaccinia virus was greatly increased.

Experiments using gonadotropic hormone were at variance with one another, and no conclusion could be drawn.—J. G. MURRAY.

TECHNIQUE AND APPARATUS

HIRATO, K. (1938). **A Modification of the Tetrathionate Medium for the Isolation of *Salmonella abortus-equi*.**—*J. Jap. Soc. vet. Sci.* **17.** 118-126 of pt. 1. 4 tables. [6 refs.] [In Japanese: abst. from English summary pp. 14-15 of pt. 2].

H. details the preparation of modifications of Müller's tetrathionate broth and Schustowa's tetrathionate agar as selective media for the isolation of *S.a.-e* and *S. typhi-murium* from highly contaminated materials. Specimens should be plated on tetrathionate-eosin-methylene blue agar immediately, and also after 10 hours' enrichment culture in tetrathionate.—R. O. MUIR.

BEVAN, L. E. W. (1938). **The Preservation of Vaccines and Solutions by Chloroform.**—*Vet. Rec.* **50.** 944-945.

B. advocates the preservation of vaccines by a concentration of 0·25% of chloroform, stating that this method gave satisfactory results in use for many years in his hands. He advocates its use for certain therapeutic preparations where a preservative is required.—R. O. MUIR.

BENDIXEN, H. C. (1938). Instrumentarium til Udtagning af Blodprøver. **[An Instrument for Taking Blood Samples].**—*Medlemsbl. danske Dyrlaegeforen.* **21.** 159-162. 3 figs.

The needle is screwed to the centre of a metal plate measuring 25 mm. in diameter. At right angles to the edge of this plate a metal half-cylinder 100 mm. long is soldered, in which the sample tube is placed when in operation. The half-cylinder with the tube constitutes an excellent handle. Under optimal conditions and with proper assistance the new instrument will enable the veterinary surgeon to take as many as one hundred samples per hour.—GUSTAV NAERLAND (OSLO).

JACKSON, C. (1938). **Automatic Control of Fixation Time of Histological Specimens.**—*Onderstepoort J. vet. Sci.* **10.** 237-238. 1 fig.

A simple device is described which automatically terminates fixation (*e.g.* at any desired hour during the night) and sets the tissues to wash. Tissues are placed in the fixing fluid in a container below a running tap, but the water is diverted until such time as the diverting device is moved aside by the release of the alarm of a household clock. For details the illustration accompanying the article should be consulted.

MANDELBOÍM, A. B. (1937). Reakcija Fridmana pri encefalomielite lošadei. **[Friedman Reaction in Encephalomyelitis of Horses].**—*Sovyet. Vet.* Nos. 11-12. pp. 62-64. 2 tables.

The reaction mentioned above is described. It consists of the addition of potassium permanganate to cerebrospinal fluid and then of trichloracetic acid and the development of a colour reaction and precipitate. [It does not appear to be well authenticated. There is no proof that it is specific for any particular disease].

MISCELLANEOUS

—. (1938). **The 1938 Veterinary Congress Held under the Auspices of the Philippine Veterinary Medical Association at the Assembly Hall of the College of Veterinary Science, Pandacan, Manila.**—*Philipp. J. anim. Indust.* **5.** 126-185. 3 photographs.

The full report of the proceedings is given, including membership lists, programme and papers. The latter constitute a summary of the past and present status of veterinary activities in the Philippines. The Philippine Veterinary Medical Association took a leading part in stimulating the government to improve the conditions of the livestock industry, with the result that an act was passed—the "Philippine Livestock Promotion Fund"—by which an impetus has been given to the improvement of breeds of animals. [Scientific matter presented at the congress is dealt with separately in this *Bulletin*].—J. E.

Clark, H. C. (1938). **The Development of International Transportation and its Effect on the Practice of Tropical Medicine.**—*Amer. J. trop. Med.* **18.** 1-7. [1 ref.]

New and quicker methods of transport have made it much easier for diseases in their incubative stage to be conveyed from one country to another, in comparison with the longer sea voyages which permitted detection before arrival at the destination. Port medical and veterinary officers must be on the alert for the presence of tropical diseases.—T. Dunlop Young.

Furlong, J. R. [Editor]. (1937). **The Preparation of Empire Hides and Skins.** pp. 126. 2 text figs., 20 figs. on 8 plates. London: Imperial Institute. [8vo] [3s. 6d.]

In connexion with its work in promoting industrial utilization of raw material of the British Empire, this book gives detailed information on hide and skin production by all the Dominions and Colonies, as well as chapters on the causes of defects in leather, flaying and preservation, and marketing [see *V. B.* **9.** 169].
—J. E.

Anon. (1937). A extincção da escola de medicina veterinaria de S. Paulo. [**The Extinction of the Veterinary School of Sao Paulo**].—*Bol. Soc. brasil. Med. vet.* **7.** 115-122.

The Veterinary Institute, as it was originally called, was created by government decree in 1917, with a qualifying course of three years. After various modifications and a change of site it emerged in 1931 as the Veterinary School of Sao Paulo, under the directorship of Dr Alexandre Mello. In January, 1934, again by decree, the school was incorporated in the University of Sao Paulo. There was a rebellion among the students, and the school was closed in 1937. It has since been reopened.—J. A. Pasfield.

OFFICIAL AND OTHER REPORTS

NORTHERN IRELAND. (1938). **Investigation by the Veterinary Research Division, Ministry of Agriculture [1937-38].** [LAMONT, H. G.]—*Rep. agric. Res. Inst. N. Ire., 1937-38.* p. 42.

An experiment on anti-abortion vaccination of calves has been commenced. A dead vaccine is being used; heifer calves will be vaccinated as soon after birth as possible and the vaccination repeated every three months until the heifers are brought into the herd for breeding purposes; a number of calves will be kept as controls. It is stated that the dead vaccine gave unsatisfactory results when used on adult cattle.—J. C. WALLACE.

SOUTHERN RHODESIA. (1938). **Report of the Director of Veterinary Research for the Year 1937.** [LAWRENCE, D. A.] pp. 12. Salisbury: Rhodesian Printing and Publishing Co., Ltd. [fcp].

The Director had no professional assistant throughout the year. The report shows the scope of the routine work.

CALF DYSENTERY was investigated, but the aetiology is obscure.

A detailed description is given of some curious cases of theileriasis. Some of them proved to be EAST COAST FEVER and others remained obscure, as a theileria-like organism observed in calves proved dissimilar to *Th. parva*, *Th. mutans* or *Th. annulata*.

FOOT AND MOUTH DISEASE virus was recovered from a Kudu cow. It was the same type as was infecting cattle. All recovered cattle reacted when reinoculated with the virus after an interval of one year, showing that immunity was not durable under field conditions.

Investigations included treatment of BOVINE HELMINTHIASIS with the standard nodular worm remedy and the nicotine-copper sulphate treatment. Although good results were obtained under field conditions, animals given a prolonged course of treatment at the laboratory were found on P.M. examination to be still fairly heavily parasitized, in spite of their improved physical condition.

The locally known "blind-sickness" in cattle, which has been investigated spasmodically for several years, does not appear to be associated with nitrate of soda poisoning as had been suggested. Nearly 5 lb. of the salt were fed to a 750 lb. cow without ill effect.—J. A. GRIFFITHS.

TRINIDAD AND TOBAGO. (1938). **Report of the Veterinary Division, 1937.** [METIVIER, H. V. M.]—*Rep. Dep. Agric. Trin. Tob., 1937.* pp. 60-65.

FIELD WORK.—Five cases of TUBERCULOSIS were found at abattoirs and testing of "in contacts" revealed nine reactors. Tests on 973 cows in 377 cow-sheds gave three reactors only, in rural districts round Port of Spain. In Tobago there were four reactors. All of these were slaughtered. Three cases of ANTHRAX occurred at the Tobago Stock Farm in one pig and two goats. 278 animals were given spore vaccine. 543 cattle from Venezuela and British Guiana were vaccinated. Bat-transmitted PARALYTIC RABIES was responsible for 57 deaths of livestock as compared with 217 in 1936 and 331 in 1935. The incidence of the disease was again highest in the north-east area in Sangre Grande district. There were no outbreaks of GLANDERS, EPIZOOTIC LYMPHANGITIS or SWINE FEVER. The following diseases were noted among livestock :– HAEMORRHAGIC SEPTICAEMIA in three pigs, STRANGLES, INFLUENZA and ULCERATIVE LYMPHANGITIS in mules, PARASITIC GASTRITIS, PNEUMONIA and OPHTHALMIA of calves; BOVINE PIROPLASMOSIS (red-water) is enzootic; BOVINE BRUCELLOSIS has a low incidence.

RESEARCH.—Research on PARALYTIC RABIES transmitted by bats was carried out by the Government Medical Bacteriologist. The results briefly summarized are :–*Desmodus* bats are susceptible to inoculation with rabies virus and may show furious or paralytic symptoms, or there may be no clinical symptoms, but those with all forms may transmit the disease. Bats " recovered " from the furious form may still transmit infection by bites for prolonged periods, whether naturally or artificially infected.—J. A. GRIFFITHS.

DENMARK. (1937). Aarsberetning fra Veterinaerdirektoratet for Aaret 1936. **[Report of the Veterinary Directorate for the Year 1936]**. [HANSEN, P.] pp. 251. Numerous tables, 1 map. Copenhagen : Johansens Bogtrykkeri. [8vo].

ANTHRAX was diagnosed in 31 herds, in which 37 head of cattle were infected, and 18 died. 1,138 animals infected with TUBERCULOSIS of the uterus or udder were slaughtered in accordance with the law. In 1936, a total of 30,250 herds were tuberculin-tested, and under the state control scheme, tests were performed on 16,844 herds containing 339,562 animals, and the owners were obliged to isolate the reacting animals. " Collective tests " supported by the state were made in 2,113 herds in 39 dairying districts ; 93·4% of these herds were free from reactors, and only 0·2% of the animals reacted. In 197 dairying districts, with 22,504 herds and 271,816 animals, reactors were found in 21·2% of the herds, and amounted to 7·5% of all the animals tested. The state paid 1,226,350 Kr. 78 Ore for the slaughter of 20,160 reactors. At the end of 1936, 1,330 poultry breeding farms were certified as free from BACILLARY WHITE DIARRHOEA and FOWL TYPHOID. Infection was diagnosed by bacteriological and serological tests on 58 farms, and in chicks from 184 uncertified farms. 1,183,146 blood samples from 4,493 flocks were examined, and samples from 819 flocks were positive.

FOOT ROT in sheep (spoken of in the report as malignant foot rot) was combated by slaughter of the affected herds. From 1934 to 1936, 103 herds, comprising 2,365 animals, were slaughtered in the south-western districts of Jutland. The slaughter and compensation policy was found to be the best way of controlling this disease.

FOOT AND MOUTH DISEASE was found in five herds in January, 1936. These herds were slaughtered, and no further outbreak occurred until February, 1937, when one herd became infected and was slaughtered. Again the country was free until August, 1937, when a single herd became infected and was slaughtered ; in October another herd became infected and was slaughtered The last two outbreaks are regarded as the first of a series originating in the big outbreak which began in France in the spring of 1937.

Ox warbles were found in 0·07% of the herds on the islands and in 23·3% in Jutland. Some progress has been made in the campaign against the parasite.

Details of other infectious and parasitic diseases are given, and also an account of the laws, regulations and orders which are of importance for veterinary work.

—H. C. BENDIXEN (COPENHAGEN).

JANSEN, J. (1938). Overzicht der onderzoekingen van het uit de praktijk ingezonden ziektematerijaal in 1937. (O.a. beschrijving van " paratyphus " bij apen, caviae, kippenkuikens, volièrevogels, zilvervossen en waschbeeren). **[Report of Diagnostic Work for 1937, Institute for Parasitic and Infectious Diseases, Utrecht University]**.—*Tijdschr. Diergeneesk.* **65.** 435-447. 2 tables. [English, French and German summaries].

A summary is given of the material sent by practitioners and diagnosed by

the Institute. A case of paratyphoid in monkeys yielded a type of *S. typhi-murium* which did not ferment rhamnose. This type occurs frequently in ducks, and enquiry revealed that the monkeys had eaten duck eggs.

S. enteritidis var. *essen*, usually occurring in ducks, was isolated from a pullet, which came from a farm surrounded by duck-farms and on which duck-eggs were also sometimes hatched.

A strain of *S.t.-m.* was isolated from some waxwings (*Bombycilla garrulus*) which died in an aviary. This strain appeared to be the type with complete fermentation of carbohydrates. After disinfection of the aviary a second outbreak of paratyphoid occurred, caused by a recently purchased sea-gull (*Larus canus*) which died soon after arrival; after this a starling (*Sturnus vulgaris*) and a wry-neck (*Jynx torquilla*) died. This proved to be a different infection, because the types of cultivated *S.t.-m.* were rhamnose-negative (the so-called "duck-type"). It is pointed out that wild sea-gulls often visit duck farms. *S.e.* var. *dublin* was found in silver foxes and raccoons.

Bacterium equirulis was isolated from pus in a case of chronic funiculitis in an old horse. A very pathogenic pure culture of *Clostridium novyi* was cultivated from a pig's kidney.

DUTCH EAST INDIES, JAVA. (1937). Veeartsenijkundig Instituut Buitenzorg, Verslag over 1936. [**Report of the Veterinary Institute Buitenzorg, Java, for 1936**]. [HUBER, F. L.]—*Jversl. veeartsenijk. Inst., Buitenz. 1936.* pp. 67-105. 10 tables, 2 graphs.

Besides a record of the material received from practitioners and of the sera and vaccines provided by the Institute, the annual report contains valuable information on several parasitic and infectious diseases.

It was proved that the method of sending blood samples by means of a stick of plaster of Paris was the most satisfactory for ANTHRAX diagnosis; the g. pig was the most suitable test animal; when the material was not quite fresh, both cultural and animal experiments were necessary; Zeissler's glucose-blood agar plate is a valuable medium for this work.

A culture of *Pfeifferella mallei* that had been cultivated for ten years on a medium containing ox bile had become avirulent for g. pigs. Research work will be commenced with this strain on horses and small test animals.

The aggressive action of BLACKLEG formol vaccine was examined, and could only be demonstrated when the vaccine came into direct contact with the BLACKLEG organisms.

During observations lasting one year, no evidence was obtained of drug-fastness of *Tryp. evansi* to naganol.

STEPHANOFILARIASIS was observed in buffaloes, affecting the ears only; treatment with "Cooper's dip" gave good results.

Observations were made on various kinds of tuberculin; the synthetic tuberculin described by GLOVER gave the best results.—JAC. JENSEN (UTRECHT).

ITALY. (1937). Istituto zooprofilattico sperimentale delle Tre Venezie: Relazione per l'anno 1936. [**Report of the Veterinary Research Institute at Padua for 1936**]. [BARDELLI, P.] pp. 36. 3 tables. [4 refs.] Padua: Tipografia del Seminario. [4to].

ROUTINE WORK.—The report gives in tabular form :- (1) a list of the materials submitted to the Institute during the year for examination and report, and (2) a classified list of diseases diagnosed. In 6,753 cases out of 9,101, the result of

examination was negative. BRUCELLA INFECTION was found in one out of 12 samples of human blood submitted. There was much BRUCELLA INFECTION in cattle. In specimens from pigs, 34 cases of SWINE FEVER were diagnosed, and 25 outbreaks of FOOT AND MOUTH DISEASE were dealt with. Much work was done on fowl diseases.

Details are given of sera prepared and distributed, and it is claimed that good results have been obtained from prophylactic vaccination in outbreaks of FOOT AND MOUTH DISEASE. A special effort has been made to investigate and deal with sterility in cattle.

RESEARCH.—There is a general discussion on the incidence and method of spread of brucella infection and of trichomonas infection in cattle. Details are given of a contagious disease, diphtherio-croupous in nature, affecting one herd, but it subsided too rapidly to admit of complete investigation.—S. F. J. HODGMAN.

BOOK REVIEWS

HEIDEGGER, E. [Dr Institut für Tierpathologie der Universität München]. (1937). Wurmtafeln zum Bestimmen der wichtigsten Haustierparasiten. [**Tables for the Identification of the Most Important Worm Parasites of Domestic Animals**]. pp. viii+121. Stuttgart: Ferdinand Enke. 135 figs. [8vo] [RM. 8.20].

This book has been prepared for the use of those who have no special knowledge of helminthology, but who occasionally find it necessary to determine the species of worms found on P.M. examination, or of eggs or larvae of parasitic worms found in the faeces.

The first two parts of the book, which is divided into five parts, give a very brief account of methods commonly used for the examination of faeces for eggs and larvae, and for the collection and examination of adult worms. The third part gives diagrammatic representations of a trematode, cestode and nematode, showing the main structures. The fourth part, which comprises the greater portion of the book, gives a very sketchy key to the differentiation of the commoner helminth parasites of domestic animals. These are arranged according to hosts, the tables giving name, site and distribution, life-history, description (in a dozen words or so) and a drawing, usually of the egg or larvae of the worm. The fifth and final part gives a diagrammatic representation of seven types of life-history of parasitic worms.

All of the diagrams are clear and the book should serve its purpose very well.

—E. L. TAYLOR.

KOCH, W. [Dozent an der Universität München]. (1939). Hormone und Hormontherapie in der Tiermedizin. [**Hormones and Hormone Therapy in Veterinary Medicine**]. pp. viii+83. 5 figs., 1 table. [4 refs.] Stuttgart: Ferdinand Enke. [8vo] [RM. 5.40].

An attempt is made in this book to describe the progress made so far in the development of our knowledge of hormone treatment in veterinary work.

In the first part the various hormones are briefly described and the method by which they control certain physiological processes is discussed. Here and there certain inconsistencies are noted, *e.g.*, the site of formation of oxytocin is (in a table) given as the intermediate lobe of the pituitary, and (in an illustration) the maximum concentration of gonadotropic hormone in mare serum is placed at the fifth month.

The second part deals with the various uses of hormones in veterinary practice. Sterility is dealt with at comparatively great length, and emphasis is thrown on the condition not only in the female, but also in the male. A table describing hormonic preparations in use includes only those manufactured by German firms, and omits any mention of the gonadotropic preparation from pregnancy mare serum, possibly the most useful of such preparations.

The book ends with a short description of methods of pregnancy diagnosis. There is no bibliography and no index.—J. M. Robson.

Deleanu, N. T. [Professeur à la Faculté de Pharmacie de Bucarest, Directeur du Laboratoire de Chimie analytique, Membre de l'Académie de Médicine et de l'Académie des Sciences de Bucarest], Fabre, R. [Professeur à la Faculté de Pharmacie de Paris, Directeur des Laboratoires de contrôle du Ministère de la Santé Publique et de l'Académie de Médicine de Paris, Pharmacien en Chef du Groupe hospitalier Necker-Enfants-Malades], & Coniver, L. [Ancien Assistant à l'Université de Bucarest, Chimiste-Légiste Lauréat de la Faculté de Pharmacie de Nancy et de la Société des Amis de l'Université de Paris]. (1938). Index médico-pharmaceutique. [**Medico-Pharmaceutical Index**]. pp. xii+756. Numerous tables. Paris: Masson et Cie. [8vo] [Fr. 150].

This is a revised reprinting in French of a book written by professors of the medical faculty at Bucarest University in 1927. Its purpose is to serve as a ready reference book for medical practitioners and chemists.

It contains twelve chapters:—introduction, poisoning, pharmacodynamics, chemotherapy, galenical drugs, pharmaceutical preparations, posological tables, opotherapy, serum and vaccine therapy, vitamins, physiotherapy and narcotics.

For veterinary workers the book is chiefly of value for reference on the nature of drugs and biological products which may be mentioned in French medical literature, and for general comparative purposes as between English and French materia medica. There is a detailed index, and the book is well printed and bound.

—J. E.

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